HIGHER EDUCATION AND LABOUR MARKET IN IRAQ

"THE CASE OF ENGINEERS"

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DEDICATION

To:-

The memory of my late mother,

My father,

My wife

My daughter - Naden,

My son - Zaid,

and to all my brothers and sisters.

Declaration:-

No portion of the work referred to in this study has been submitted in support of an application for another degree or qualification of this or any other university or other institution of learning.

The Author.

ABSTRACT

This study sets out to investigate first whether the rapid expansion in the higher education system in Iraq, which has taken place over the last decade, is in fact succeeding in satisfying the social demand for higher education and second, whether the graduates are being utilized effectively. Special emphasis is devoted to the utilization of engineers in the Iraqi labour market. After reviewing a wide range of literature, a questionnaire was designed and 125 personal interviews were carried out for the 1980 engineering graduates. The results achieved by means of proportions, correlations, breakdown analysis.....etc.

The study is composed of nine chapters. The first chapter is concerned with the background of the study, its purposes, methodology used, and its limitations. The second chapter offers a general overview of the socio-economic factors of the Iraqi society. Chapter three is concerned with the origins of the Iraqi educational system, with special emphasis on the development of the higher education system. Chapter four examines the demand for higher education in Iraq, and the main reasons for pursuing special fields of study. Chapter five attempts to examine the utilization of university education at work while chapter six examines some factors in the world of work, which might have their influences on the utilization of engineers at work. The quality of the engineering graduates and its possible influences on the utilization of the graduates discussed in chapter seven. Chapter eight deals with the management process and the structure of higher education institutions.

Finally, chapter nine presents the general conclusions of the study and the main recommendations suggested by this research.

In this sense, the study hopes to provide some guidelines for the future development of higher education in general and engineering education in particular, to meet needs for highly qualified manpower, and to stimulate further research to co-ordinate and encourage closer relationships between Iraqi universities and the institutions of employment, in which the highly qualified manpower needs for the country, can be satisfied and utilized effectively.

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CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF THE PRESENT STUDY

During the last ten years, the problem of the relationship between higher education and employment has increasingly attracted the attention of decision-makers in Iraq. The shortage of qualified people, especially engineers, has been very acute since 1974, when the period of "economic boom" was started after the nationalization of oil in 1972, and the increase in the price of oil in the world-market. Accordingly, government revenues from oil increased from Iraqi Dinar (I.D.) 1.3 billion in 1973 to I.D 6.5 billion in 1978. (Ministry of Planning, Annual Abstract of Statistics, 1978). The government investment, consequently, increased from I.D 0.3 billion in 1973 to just under I.D 3 billion in 1978 (Sabie, 1979, 71).

At this stage, the demand for highly qualified manpower appeared to exceed the supply. Planners were quick to argue that expansion in higher education institutions was essential to solve this problem. Thus more and more money came to be invested in higher education. The number of students admitted more than doubled between 1970 and 1975. It is essential to understand the real factors behind this expansion.

Three principal factors have been recognized as being responsible for this rapid expansion. First, among them is the economic factor. In Iraq, the policy behind the development of higher education was to supply the economy as rapidly as possible with the qualified manpower necessary to eliminate human resource "bottlenecks" in most economic sectors. Since 1958 when Iraq secured political independence, one of her major aims was to replace the many expatriates holding high-level

decision-making positions in a wide range of public and economic services. The vacuum created by their departure led to an increased demand for secondary school leavers to become university graduates. Therefore emphasis had to be placed on the development of higher education.

Second, since the beginning of the 1970s, when the oil wealth gave the government an opportunity to apply it, education in Iraq has been considered to be a national goal. All the institutions of higher education are free, while the special economic incentives, prestige, and power attached to the jobs obtained by graduates with higher education attracted more and more secondary school leavers.

Third, there were also political factors responsible for expansion in higher education. To all the regions within a country, an institution of higher education was regarded as a symbol of national or regional prestige. Economic criteria played a small role in the establishment of many of the higher education institutions, and the employability of the graduates often played no role at all.

The rapid expansion of higher education has created as many problems as it has solved. The most important are:

1. The mismatch between the output of the higher education system and the economic needs for highly qualified manpower, in quantitative terms. It was stated in 1974 that the number of graduates in specific areas, such as engineering, management, and medicine were lagging behind the demand, while graduates in human sciences faced

many difficulties in finding jobs relevant to their university education.

2. Since the growth of enrolments is more than in staff, and other essential facilities, the deterioration in the quality of graduates is inevitable.

This situation was an object of government criticism, when an official report stated:

> "...Universities are producing tens of thousands of graduates annually who are of no use to the industrial, agricultural, and services programs and development. The government finds it necessary to find jobs for those graduates in institutions which are already overstaffed. The institutions are suffering from disguised unemployment for university graduates". (Ministry of Information, 1979).

Later the Ministry of Higher Education in its 1981 annual report, listed a number of difficulties affecting the change within the higher education system. Among them are:

1. In spite of the large increase in the places made available during the last ten years, they were unable to keep growth within the individual demand for higher education.
2. It has been suggested that universities are graduating professionals who are of no use to the economic sectors, because their qualifications are not urgently needed by the labour market. A great amount of these professionals, at large, could create a group of unemployed graduates.
3. There has been a tremendous increase in public funds devoted to higher education institutions. However, large proportions of these funds were spent on non-academic activities such as administration and students' stipend.

4. The higher education institutions do not plan their development in either the short or long term.
5. The higher education institutions lack co-ordination between them and other levels of education, especially with the secondary education system. (Ministry of Higher Education, 1982).

In addition to the inadequacies found in the higher education system, another important problem goes back to the traditional attitude towards government posts, as well as to the attitude and the philosophy of the people towards manual labour. Sabie stated that "There were certain occupations, some highly profitable, with which people were ashamed to be associated". Indeed, with this kind of attitude the industrial and technical skills have not been sought on a large scale. He added: "People have failed to accept the importance of industrial and technical schools and training programs, and as a result they have not encouraged their youth to enter these programs instead of university education" (Sabie, 1978, 81). Accordingly, when the students in secondary schools graduated, they did not enter into industry, business or agriculture, except to go into the civil service or higher education institutions.

A remarkable achievement in increasing the number of higher education graduates took place during the 1970s. Between 1970 and 1979 their total number more than tripled, as shown in Table 1-1. Most of the expansion was in the main professional areas such as engineers and agriculturists, in which the real number of graduates increased more than five times in both of these, see Table 1-2.

Growth of Annual Output of Higher Education.

(N 1970 = 7779)

Table 1-1 (Percentage)

	Field of Study	1970	1979
1	Humanities and Social Sciences	100	217
2	Engineering and Industrial Programs	100	588
3	Natural Sciences	100	144
4	Agricultural and Veterinary Sciences	100	625
5	Medical Sciences	100	179
6	Education	100	518
	Total	100	294

Source: Unesco Statistical Yearbook, (United Nations Educational, Scientific and Cultural Organization, Paris, 1973 and 1982).

Output of Higher Education in 1970 and 1979.

(N 1970 = 7779, N 1980 = 22886)

Table 1-2 (Percentage)

	Field of Study	1970	1979
1	Humanities and Social Sciences	48	35
2	Engineering & Industrial Programs	15	30
3	Natural Sciences	16	8
4	Agricultural & Veterinary Sciences	5	10
5	Medical Sciences	9	5
6	Education	7	12
	Total	100	100

Source: Ibid.

However, many official reports are still claiming that there is an acute shortage of highly qualified manpower, and this shortage is the most important reason delaying the achievement of the development plan targets during the 1970s. For example, one forecast based on prospective growth of Iraqi economy indicated that industrial projects carried out in the 1981-85 plan called for nearly 150,000 university degree holders (Economist Intelligence Unit, 1980, 9). The total output of graduates stood at less than 100,000 in all. (Hamame, 1981, 7). Another World Bank study estimates (based on the situation in 1980) that by 1985 Iraq will depend on non-Iraqis for between 20-30% of its entire qualified labour force. (World Bank, 1980, 36).

In the absence of the official and up-to-date data about the real demand in the whole Iraqi economy for highly qualified manpower, in which one can compare it with the number of graduates (in the supply side), no reliable judgements about these claims can be made.

The author, however, believes that some of these claims about the shortages of highly qualified manpower are exaggerated. Some evidence could help in examining such beliefs.

1. A study of the employment of professional agriculturists in Iraq found that over 5000 of them were working outside the agricultural sector. Those represent about one-third of the total graduates in this field at the time of the study (Al-Jenabie, 1981).
2. A quick comparison between Iraq and U.K. shows that:
   (a) Iraq has more enrolments in higher education than U.K. compared with the total population. The average number of enrolled students

in higher education per 1000 population in 1980 was 6.3 in Iraq, while in U.K. was 4.1.

(b) Regarding the number of engineering graduates, the higher education system in Iraq has also graduated more engineers than U.K. compared with the population in both countries. The average number of graduate engineers per 100,000 population in 1980 was 25 engineers in Iraq compared with only 14 engineers in U.K., as shown in Table 1.3.

Accordingly, the problem of the shortage of highly qualified manpower in general, and in engineers in particular, might not be in quantitative terms (the number of graduates) but in qualitative terms which could have two aspects:

First, in the standard of graduate which related to some factors at educational system in general, and at higher education system in particular.

Second, in the utilization of those engineers which related to some factors at the labour market, such as recruitment, promotion, salaries policies....etc.

Concerning the first set of factors, it is clear that at the beginning of the 1970s the large increase in secondary school leavers put an enormous pressure on higher education institutions to admit a large number of them. With limited growth in the essential elements, such as teachers, books...etc., the quality might have dropped.

Higher Education Comparison Between Iraq and U.K. - 1980. (Selected figures).

Table 1-3

Selected Indicators	Iraq	U.K.
Population (in Millions)	13.1	55.9
Higher Education Enrolment (000.0)*	81.8	231.8
Engineering Education Enrolment (000.0)	14.8	36.8
Higher Education Graduates (000.0)	16.0	61.9
Engineering Graduates (000.0)	3.2	7.7
Proportion of Eng. Enrolments of Total	18%	16%
Enrolled Students per (000.0) popul.total	6.2	4.1
Enrolled Students per (000.0) pop.eng.students	1.1	0.7
Graduates per (100.000) population - total	1	1.1
Graduates per (100.000) population eng.grads.	24	14

* Undergraduates - home student only

Source: (1) University Grants Committee (1982), University Statistics, Vol. 1 - Students and Staff, (University Statistical Record, Central Record Office, London)

(2) Unesco Statistical Yearbook (1982), (Unesco, Paris).

On the other hand, some policies applied in the labour market for highly qualified manpower might be responsible, to some extent, for inflating the current shortage of those people, hence the main hypothesis in this study are that the shortage of highly qualified manpower in Iraq might be caused by two main reasons:

1. The present stock of highly qualified manpower may be ineffectively utilized, and
2. The quality of graduates may be low which leads to a fall in the productivity of the graduates in their current jobs.

1.2 AIMS AND SCOPE OF THE STUDY

With the above background in mind, the general aim of the research is to investigate the relationship between the higher education system and the labour market for highly qualified manpower. Special emphasis will be devoted to the relationship between the engineering education and the labour market for engineers. Within the framework of the general aim, this study sets out to consider whether the rapid expansion in the higher education system in general and engineering education in particular, which has taken place over the last decade, are in fact succeeding in satisfying the social demand for higher education, and whether graduates are being effectively utilized.

Moreover, this study will try to establish further relationships between admission policies into higher education institutions and socio-economic backgrounds in order to help clarify the social structure of students at higher education institutions. In view of the general aim

of the research, this study sets out to seek specific answers to five major questions:

1. What are the main socio-economic factors which increase the social demand for higher education in Iraq?
2. What are the main reasons influencing the Iraqi secondary school leavers to pursue a specific field of studies in higher education?
3. How have the higher education institutions developed and coped with the increasing demand for higher education?
4. How effectively is the present stock of highly qualified manpower utilized?
5. What is the effect of public policies practiced in the labour market, such as recruitment, salary, promotion...etc. on the present utilization of highly qualified manpower?

The present study in attempting to ascertain the answers for the above questions, fully recognises that further research will need to be undertaken based on the other factors. For example, the demand for highly qualified manpower at the national level for the next decade, the projections of the secondary school leavers...etc.

However, due to the lack of previous data on this problem in Iraq, this research, its data and findings can undoubtedly serve as a starting point for further studies concerned with this problem. The above objectives played an important role in determining the selection of data to be collected. We shall discuss in the following pages how the study was organized, its data needs, methodology of data collection and methods of analysis.

1.3 NEED FOR THE STUDY

An expanding economy and industry in a developing country, such as Iraq, requires detailed and reliable information about the utilization of its highly qualified manpower, their career, working conditions, and salaries. This study tries to provide such information for the first time. It could be used by the Ministry of Planning, Ministry of Higher Education, University of Technology, and other Iraqi universities to plan improvement in their programs. It will bring together and explain in one document, the past and present status of the higher education system in general, and engineering education system in particular, with regard to its administration, structure, facilities, curricula, enrolments, staff and working environment. Such factors have a great influence on the students' decisions to select a particular type of higher education, on graduates' decisions to select a particular type of enterprise. The recommendations of this study aim to provide guidelines for the future development of engineering education to meet needs for engineering manpower. However, it is acknowledged that such guidelines will need to be periodically reconsidered.

This study aims to suggest new ways to improve the higher education system in Iraq. It hopes to contribute to planning the management of the development process, and to stimulate further research to co-ordinate and encourage closer relationships between the productive sectors and the higher education institutions, in which the highly qualified manpower needs for the country can be satisfied and utilized effectively.

1.4 METHODOLOGY USED

Data on the relationship between the system of higher education and the labour market for qualified people can come from many sources. National statistics, published reports from the labour market, ministries, institutions of higher education...etc., all provide such data. Two possible methods were explored to tackle the problem in the present study as follows.

1.4.1 Analysis of Census Data

The advantages of these kinds of data are that census avoid sampling error. Actually, such data are already collected by different national agencies for their own purposes. What the researcher has to do is to design his study so that answers to the listed problem areas could be available from the analysis of the census data. Although this method would reduce the cost and time of collection of data greatly, there are many disadvantages, (Ferber, 1972, 66) such as :

1. Census cannot give all the information needed for an analysis of the relationship between higher education and labour market, and any modification of the research design needed for adaption with the census statistics may have to sacrifice analysis of important problem areas.
2. The accuracy of census statistics in Iraq as in most developing countries, has often been questioned. Although there has been a remarkable development in the last few years, the difficulties in getting some detailed data still exist.

3. Census data very rarely considers the attitudes and expectations of different social and professional groups, which according to the objectives of present study play an important role in explaining the relationship between the higher education system and the labour market.

In spite of these difficulties, it is useful to use some census data to clarify the general trends of the development of the higher education system and other relevant characteristics of the Iraqi economy.

1.4.2 Follow-up Studies of Graduates

This approach identifies the graduates as the most important group at a particular point in time. It usually takes a representative sample of them and analyses the relationship between higher education and the world of work. This approach is supposed to provide tools for the decision-maker for adjusting the world of higher education to the world of work and vice versa, in a short period of time. The importance of such studies has been documented by many authors. O'Connor in emphasizing the significance of such studies wrote:

> "Rapid changes in technology mandate continuous revision of technical instructions. Feedback of information from recently employed graduates provides one of the best means of obtaining an evaluation of the utilization of their university education at work". (O'Connor, 1975, 11).

Two possible ways in which one can carry out the follow-up studies of graduates are the posted questionnaires and the organized interviews.

1.4.2.1 The Posted Questionnaire

The posted questionnaire is "a list of questions for information or opinion which is mailed to potential respondents who have been chosen in some designated manner" (Miller, 1978, 74). With questionnaires, a large number of individuals can be involved. Assuming the questionnaires are well constructed, the data so gathered can typically be organized in a form suitable for numerical analysis on the computer. This in turn enables large masses of data to be summarized into small comprehensible tables. Other advantages of this method are:

1. It promises to secure data with minimum of time and expense.
2. Affords wider geographic contact.
3. Greater coverage may yield greater validity through larger and more representative samples.
4. Greater uniformity in the manner in which questions are posed.

The main disadvantages of these methods are:

1. The percentage of questionnaires returned is usually low, especially in studies conducted in developing countires.
2. Those who answer the questionnaires may differ from the non-respondents thereby biasing the sample.
3. Validity depends on the ability and willingness of the respondents to provide information.

1.4.2.2 The Organized Interviews

The organized interviews represent a personal contact between an interviewer and a respondent aimed to collect specific data. They are generally more difficult to administer (compared with the questionnaires) and more expensive in time and money. (Mayntz, 1976, 100). The main advantages of this technique are:

1. It usually yields a high proportion of returns.
2. It can probe more deeply and can ensure that the respondent completely understands the question, since the interviewer can clear up seemingly inaccurate answers by explaining the question to the informant. (Miller, 1978, 86).
3. The interviewer can collect supplementary information about the informant's personal characteristics and environment which is valuable in interpreting results.
4. The organized interview may take long enough to allow the informant to become oriented to the topic under investigation. Thus recall of the relevant material is facilitated.
5. The quality of the data is typically higher than data from questionnaire surveys, and the amount of missing data is typically lower.

For the above advantages and since this approach can (1) provide quick answers for many questions in the present study, (2) provide a diagnostic analysis of the current situation to the decision-maker and planner at the Ministry of Higher Education, (3) develop a data base with a form of questionnaire that could be used by the Iraqi universities in the future, and (4) the practical nature of the study,

the simplicity of the analysis, and the possibility of following up the situation over time, made the researcher accept this approach for the current study. The following sections give details of the questionnaire design, the data needed for the study, and the method of analysis.

1.5 THE SAMPLE

Studying the relationship between higher education and the labour market in Iraq should ideally include a sample drawn from all university graduates in Iraq at a certain point in time. However, this researcher has chosen a sample drawn from engineers who graduated from the University of Technology (UOT)(*) for the following reasons:

1. The shortage of engineers has been thought to be more visible than that of other qualified manpower in Iraq during the late 1970s.
2. More than 50% of Iraqi engineering graduates in 1980, graduated from UOT.
3. The typical characteristics of UOT graduates in which most social classes in Iraq are respresented, could help in diagnosing the influences on the decisions of the graduates to pursue a specific field of study at a higher educational level, which have important implications for this study.

(*) The University of Technology (UOT) was established in 1975 and specializes in engineering studies. At that time it included three main faculties - Mechanical, Electrical and Civil Engineering. Six new faculties were established later; those are Technical Training, Control & Systems, Chemical, Production, Architecture, and Applied Sciences. UOT total enrolment in 1980 was about 8000 undergraduates, which represented about 10% of total enrolments at all Iraqi universities. For more details about UOT see Section 3.4.

4. Since the recruitment, promotion, and salary policies are the same for all Iraqi graduates, one can, to a large extent, generalize most of the results obtained in the present study.
5. In order to carry out some statistical analysis, one needs to hold constant a large number of environmental factors which might be different if the sample was drawn from more than one university in different regions or different fields of study.

For the above reasons, it was felt that the sample for the present research could reflect the general opinion within the total population of Iraq engineers in particular and other highly qualified people in general. This will be discussed in more detail in the next section.

1.6 THE QUESTIONNAIRE AND THE SURVEY

1.6.1 The Questionnaire: Construction & Contents

The nature of the study, the diversity of the data sought, and the need to ensure some degree of anonymity were some of the reasons which favoured the use of the organized interview rather than any other method of research. Furthermore, the nature of the sample, environment restrictions and the limited time during which the fieldwork had to be completed were other compelling reasons for choosing this method. The original version of the questionnaire was prepared in English then translated and printed in Arabic.

Items for use in the questionnaire were formulated on the basis of their relevance to the main concern of the study. In order to fulfil the requirements laid down in the aims of the research, the

questionnaire is divided into four sections (see Appendix 1-A and 1-B for the English and Arabic versions of the questionnaire).

A : Biographical details (Q2 to Q12)

B : Job Characteristics (Q1, Q18, Q19 and Q20)

C : Graduates' opinion about the training at UOT (Q13-Q17)

D : Details about their working environment (Q21-Q27)

Under Section A, factual information was requested concerning age, place of birth, gender, parents' educational level, parents' working fields, and type of education and qualificatons obtained. Two stages of education were covered, in that information concerning both secondary and higher education was collected. It was felt that not only could these factors have an interaction, but that they might influence the attitudes of the respondents as well.

Section B requested information about the present jobs of respondents, including if applicable, their reasons for working in fields other than their specializations. In addition, questions were asked about the field of present job, type of enterprise, and the region. It was considered that the type and location of a firm might affect the attitudes of the respondents on the final analysis. The inclusion of this information was to safeguard against such an eventuality.

The questions in Section C aimed to seek out respondents' opinions about their education at UOT. Questions included such items as the length of time required to finish the UOT course, and the distribution of working time while they attended UOT courses.

Section D was concerned with some aspects of the present jobs for UOT graduates. The questions were peripheral to the main characteristics of those jobs, as it was considered that the answers obtained would then indicate some inference regarding the attitudes of engineers to the present working conditions.

Some questions contained a Likert type of semantic differential rating scale which the respondent answered by simply ticking the appropriate box. It must be accepted here, that in certain instances the grading of the responses may not be truly linear, but they are nevertheless a continuum and, as such, can be coded with reasonable confidence. One such example is the scale of parents' qualifications. These range from illiterate at the lower end of the scale to those with a Ph.D. degree at the upper end of the scale. In such a case, there is no positive numerical linear grading between illiteracy and a Ph.D. degree. Nevertheless, the author felt that numerical coding of this type was justified for the research as it was not intended to relate on to the other, rather to establish attitudes applicable to each group of qualifications.

In other cases, an open-ended question was provided to leave enough room for the respondents to add any relevant comments which could help in interpreting the results. In total, the questionnaire consisted of 27 questions, having responses varying from simple "yes" or "no" to those having more than 6 possible answers. The finally typed questionnaire was reduced in size to A4, and presented to the respondents as a 4-page document only. This it was hoped, would have psychological benefits for the researcher, in the sense that the

respondents would be more inclined to answer such an apparently small document. (See Appendix 1A and 1B for the English and the Arabic versions of the questionnaire).

1.6.2 THE SURVEY

For the purpose of the present study, the researcher visited Iraq from October 1983 to March 1984, in order to complete the survey and to collect other relevant data. At the first stage a list of the names of 1980 graduates were prepared according to the Registration Office records at UOT. The size of the sample taken would be limited by time and financial considerations. The current research is a survey based on a random sample of respondents drawn from 1980 UOT gradutes.

A stratified random sample was chosen, by dividing the 1980 graduates according to their faculties, which are Mechanical, Electrical and Civil Engineering, then a random sample from graduates in each faculty was taken by choosing at random, one out of each three graduates in the original lists, which constituted 155 gradutes who represent 33% of the 1980 graduates.

The fieldwork began in November 1984 at the Iraqi Engineering Union - Baghdad. (This is the only engineering union in Iraq and all Iraqi engineers must be registered with this union in order to practice their profession). Fortunately this was just the time for renewing engineering registration, which all Iraqi engineers are supposed to do at the union office annually. These circumstances facilitated the research work and enabled him to conduct 127 interviews within 3 months,

only two of which were incomplete. The achieved sample of the research constituted 125 graduates, who represented 81% of the planned sample, and 27% of the 1980 UOT graduates.

Having collected the data from the specific sample, the researcher began work on the next stage which involved the coding of all responses. A numerical code was constructed and the responses were coded in the column designated for this purpose in the Arabic version of the questionnaire.

After the coding was finished, the data was processed in the "Computer Centre of Glasgow University", using a modified program of the "Statistical Package for Social Sciences". (Nie, H., SPSS, 1976). The data was entered in a specific file in the computer. At this stage of processing the computer was used and the results were tabulated according to the different variables representing the social background, and personal characteristics of the respondents in order to see the main aspects and the general results.

Proportions, standard deviations, non-parsons correlation, and breakdown analysis were the major techniques of analysis. A conventional level of significance of 0.05 was used in testing the validity of the results achieved by the various techniques of analysis employed.

1.7 THE MAIN CHARACTERISTICS OF THE ACHIEVED SAMPLE

Some basic and important characteristics of the sample achieved can be used as marker variables, in order to assess the extent to which the achieved sample is representative of the population, and to which the generalization of the researh results is desired. These assessments may be made by referring to reliable and representative statistics. One of these variables is gender of graduates. The research results show that the proportion of females interviewed constituted 13% of the sample achieved, their proportion among the 1980 graduates being 15%. The distribution of the 1980 graduates and the achieved sample by gender is demonstrated in Table 1-4. While Table 1-5 shows the achieved sample by sex and specialization.

No significant differences were found between the UOT graduates and the achieved sample, in the location of their present jobs. (See Table 1-6). The data showed that the age of the interviewed graduates varied from 25 to 29 years, (Table 1-7), the mean age 26.2 years. About half of them were employed in industrial or civil service sectors. As shown in Table 1-8, 88% of the sample achieved are employed in the public sector, while employers in semi-public (or quasi-covernment sector) constituted only 12%, Table 1-9. Finally about two-thirds of the sample were working in Baghdad, Table 1-10.

Accordingly, the achieved sample does seem to be precisely representative of the total population of the 1980 UOT graduates, in the statistical sense, in respect of faculty, gender, place of work.

Number of UOT Graduates in 1980 and the Achieved Sample in Present Research.

Table 1-4 (Percentage)

	Specialization	UOT Graduates in 1980		The acheved sample	
		Total	Female	Total	Female
1	Mechanical Engineering	42	49	41	56
2	Electrical Engineering	33	28	34	25
3	Civil Engineering	25	23	25	19
Total		100	100	100	100
(Number)		(465)	(71)	(125)	(16)

Distribution of Interviewed Graduates by Specialization and Sex.

Table 1-5 (Percentage)

Specialization	Sex		Total
	Male	Female	
Mechanical Engineering	82	18	100
Electrical Engineering	91	9	100
Civil Engineering	90	10	100
Total	87	13	100

Distribution of UOT Graduates in 1980 and the Achieved Sample by Place of Present Jobs.

Table 1-6 (Percentage)

Place of Present Job		UOT graduates (%)	Achieved sample (%)
1	Baghdad	52	58
2	Mosul, Tamem & Basrah	36	31
3	Other provinces	12	11
Total		100	100
Number		(382)	(125)

Distribution of Interviewed Graduates by Age and Specialization.

Table 1-7 (Percentage)

Age	Specialization			Total
	Mechan.	Elect.	Civil	
25 years	18	42	55	35
26 years	20	37	32	19
27 years	25	17	10	19
28 years	31	2	3	14
29 years	6	2	0	3
Total	100	100	100	100
Mean(years)	26.9	25.9	25.6	26.2
St. dev.	1.2	0.9	0.8	1.16

Distribution of the Interviewed Graduates

By Specialization and Sectors of Employment

Table 1-8 (Percentage)

Sectors of Employment		Specialization			Total
		Mech.	Elect.	Civil	
1	Industrial	49	28	3	30
2	Research & Education	6	21	26	16
3	Building & Construction	16	3	39	17
4	Civil Service Offices	17	16	26	19
5	Transportation & Communications	6	16	0	8
6	Others	6	16	6	10
Total		100	100	100	100

Distribution of Interviewed Graduates by Specialization and Type of Enterprise.

Table 1-9 (Percentage)

Specialization		Public	Quasi-g/ment	Total
1.	Mechanical	94	6	100
2.	Electrical Eng.	77	23	100
3.	Civil Eng.	94	6	25
Total		88	12	100

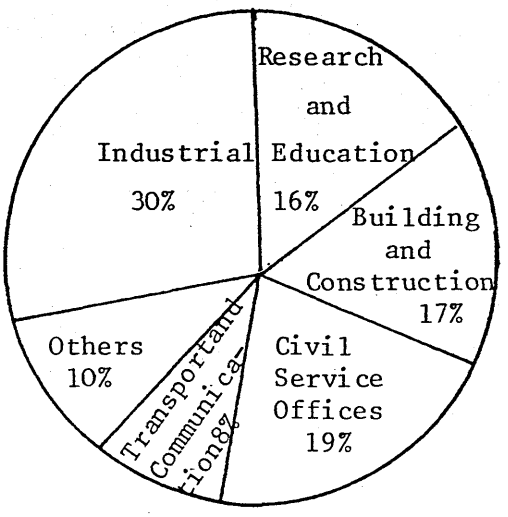
Distribution of Interviewed Graduates by Specialization and Place of Work.

Table 1-10 (Percentage)

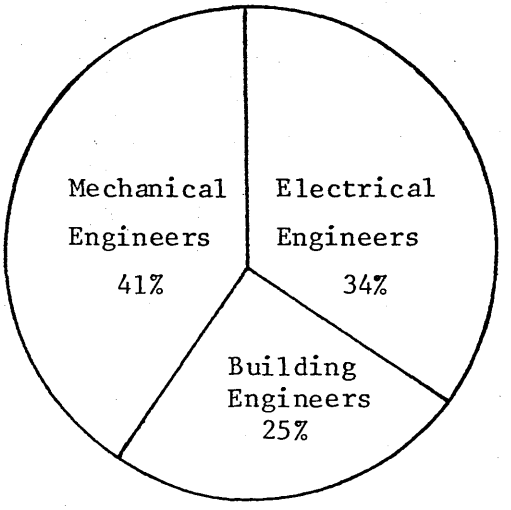
Specialization	Baghdad	Mosul, Tamem & Basrah	Other Provinces	Total
Mechanical Eng.	37	47	16	100
Electrical Eng.	79	14	7	100
Civil Eng.	61	29	10	100
Total	58	31	11	100

Figure 1-1: Distribution of Graduates Interviewed

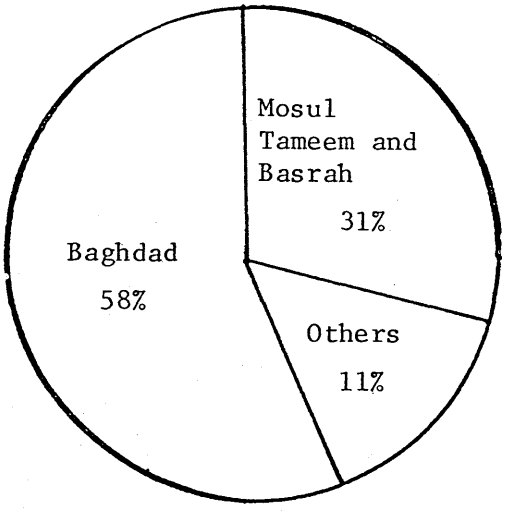
A. By Sector of Employment



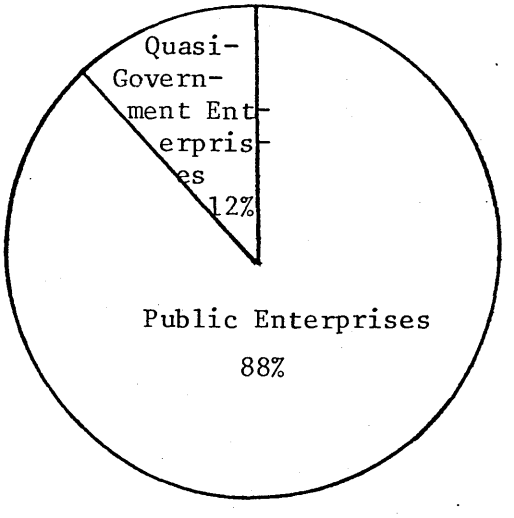
B. By Field of Study (specialization)



C. By Place of Present Job



D. By Type of Enterprise



1.8 OTHER SOURCES OF DATA

This study is based primarily on the data collected by means of the interviews carried out by the researcher for the sample of 125 engineers graduated from the University of Technology at Baghdad in 1980. It is dependent also on governmental reports and documents, Unesco publications and other available published or unpublished material about higher education and labour markets for qualified people in Iraq and other countries. More than 40 Ph.D. and M.Sc. thesis were consulted in the relevant fields. The author, with the help from Glasgow University Library staff, carried out a computer search in 1983 and in 1985 in order to determine the most relevant references in this field. Finally, the study is based on the experience and observations of the author during his work as a lecturer at UOT between 1978 to 1980, a member of the Planning Committee in the Ministry of Higher Education - Iraq, and director of Administrative and Financial Office at the University of Technology during 1980-1982.

1.9 LIMITATIONS OF THE STUDY

The present study represents the first of its kind in Iraq and is not without certain limitations, such as:

1. Due to the absence of a comprehensive and integrated data-base on higher education and labour market, the objective of the research was quite ambitious. So it was decided to limit our diagnosis to engineering higher education only in order to make the current research manageable during the limited time available to the researcher.

2. The data base for current study was generated through the interviews of UOT sample graduates, where due to absence of the entire population form, the researcher depended on judgement sample and the sampling faction has not been uniform in all cases.
3. The statistical information is also limited according to their availability from the various ministries, Education, Higher Education, and Planning, and other national and international agencies.
4. We have to depend quite often on a subjective assessment of particular higher education characteristics because of the lack of objective measurements.
5. This study is further limited to the information published by the Iraqi Government and its interpretation, as well as the ability of the investigator to interpret responses accurately and to communicate them effectively.

In spite of the limitations mentioned above, the study has added to the knowledge-base of the decision-makers of engineering education in particular, and higher education in general, as well as to the decision-makers in the labour market in Iraq, which could provide some useful hints for higher educational planners in the country. The researcher also feels that the data-base created could provide important materials for social science researchers in Iraq.

1.10 ORGANIZATION OF THE STUDY

It is important to give a brief account about the organization of the present study. As we have seen, the first chapter provides an introduction, which included the background of the study, its aims,

methodology used, limitatons and organization.

The second chapter gives a general summary about the socio-economic factors of the Iraqi society. Among them are: the establishment of the state of Iraq, the economy, the role of oil revenues in the development process in Iraq...etc. Those aspects could help to explain some results of the present study.

The third chapter deals with the origins of the Iraqi educational system, its present structure and administration. This chapter presents a brief non-evaluative description of the major historical development of the educational system in Iraq up to 1980. Section 3-3 is devoted to the University of Technology (UOT) establishment, its curriculum, structure and administration. The importance of this section is due to the study sample which was drawn from UOT graduates. This chapter is designed to acquaint the reader with the major circumstances preceding the development of the present education system, with special emphasis on the development of higher education system.

Chapter four examines the social demand for higher education in Iraq, its influence on developing the higher education system, the socio-economic background of UOT graduates, and the main reasons for pursuit of special fields in higher education.

Chapter five aims primarily to diagnose the present relationship between engineering education, as a sample of higher education, and the labour market throughout the flow of UOT graduates to the world of work. An attempt is made in this chapter to examine the applicability, or

the utilization of, university education at work. This intends to find to what extent the present stock of engineers are uitilized, and its possible effect on the present shortage of engineers.

Chapter six examines some factors at the world of work for UOT graduates, with special emphasis on job mobility and income structure for those graduates. These factors must be recognized if future plans for close links between higher education and the labour market are to be formulated. In addition, the influence of socio-economic background, personal characteristics and working conditions factors are examined by using breakdown analysis technique in order to determine the effects of each factor.

Chapter seven offers a review of the quality of UOT graduates and its possible influences on the utilization of the graduates.

Chapter eight deals with the management process at higher education institutions in Iraq. This is intended to explain how those institutions cope and develop with the socio-economic environment in Iraq, and its influences on the present performance of higher education institutions.

Finally, Chapter nine presents the general conclusions of the study and the main recommendations suggested by this research.

CHAPTER 2

IRAQ: THE SOCIO-ECONOMIC BACKGROUND

2.1 INTRODUCTION

Before proceeding to the analysis of the development of educational systems we would like to deal in this chapter with the socio-economic factors which have a great influence on the development of educational systems in general, and on the higher education system in particular, as well as on the labour market for high level manpower.

This chapter includes a preliminary effort to outline historical aspects of state formation in modern Iraq. Special interest has been devoted to studying the Iraqi population, their characteristics and growth. As Iraq has a longer experience of development planning than any other Arab country dating back more than three decades, some review of its experience is clearly instructive as well as its achievements throughout this period. Since oil plays a major role in Iraqi affairs, like other oil producing countries, it is important to give the reader a brief account of the influence of oil on the Iraq economy, with special emphasis on the industrial and agricultural sector. At the end of this chapter we will discuss the development of the labour force during the last decade, with special concentration on highly qualified manpower.

The author would like to draw attention to the fact that the discussion of the above topics will be very brief and intends to help in explaining some results in this study about the utilization of highly qualified manpower. It does not intend to give full details about all factors influencing the Iraqi economy during the last decade, which were and will be under study by many specialists in Iraqi affairs.

2.2 THE ESTABLISHMENT OF THE STATE OF IRAQ

The modern state of Iraq developed from three Ottoman Turkish Provinces - Baghdad, Basrah and Mosul, which were detached from the defeated Ottoman Empire at the end of World War I. In 1920, after almost 400 years of Turkish rule, the area was given to the British under the League of Nations Mandate. Thus started Britain's involvement in Iraq, an involvement which was to remain even after Iraq became so-called politically independent from Britain in 1932, and was admitted into the League of Nations. During these twelve years of British administration, developmental efforts were concentrated on the oil sector. This led to the neglect of other sectors in general, and the higher education sector in particular. There were no universities, except the College of Law (1909) which had less than thirty students enrolled and the College of Medicine (1927) which had less than twenty students enrolled. (Al-Dojaly, 1963, 10).

The character of central government - located in Baghdad - changed considerably between 1920 and 1958. The firm rule of King Faisal I (1921-33) gave way to the rather weak rule of his son Ghazi (1933-39), and that in turn to the somewhat conspiratorial politics of the Regent Abd-Allah in the 1940s and early 1950s while King Faisal II (1939-58) was an infant. (Niblock, 1982, 4).

In July 1958 the monarchy was overthrown. Significant social and economic reforms were undertaken, land reform was enacted, and the state took an increasingly active part in directing and controlling the industrial sector. Yet many of the new programmes and policies were

ineffectively pursued, due to the political instabilities following the struggle for power. During the period 1958-68, three governments ruled in succession. Throughout this period, the government administration was marked by weakness and political conflicts, with crises in the public sector brought about by mismanagement. (Khadduri, 1978).

A new government took over power in July 1968 in a bloodless revolution. Since then the "Arab Socialist Ba'th Party" has been in power. The political stability in subsequent years comprises an important era in the development of modern Iraq. The new government moved with dispatch to devise and implement major programmes in order to raise the living standards of Iraqi people, and to achieve social equity. Remarkable achievements are obvious in major fields, notably the nationalization of the Iraqi Petroleum Company (IPC) in 1972, as we shall explain later in this chapter. The government's overall control of the distribution of wealth, of wages, and prices ensure a well balanced growth in individual incomes, which accompanied the increase in oil prices after 1973. National income per capita increased more than four-fold between 1970-79 (in constant price), to be exact from I.D.95 to 426. (Ministry of Planning, Annual Abstract of Statistics, 1979). The main factors behind these achievements are the political stability during the 1970's and the leadership drive. The development in the main sectors during the 1970s will be discussed in more detail in the following sections.

2.3 POPULATION: GROWTH AND THE MAIN CHARACTERISTICS

The total population in Iraq has increased from 8.1 million in the 1965 census to 12.1 million in the 1977 census (a growth rate of 3.4% per annum), and to an estimated 15.5 million in 1985 (a growth rate of 3.1% per annum). Two factors are behind the latest estimation. On one hand, with the national per capita increased by more than four-fold during the 1970s, the population tends to have less children than before. On the other hand, by the state encouraging the people to have more children by giving them monetary incentives, both forces are at work in the Iraqi situation.

According to the 1977 census, some 63% of the population lived in urban areas compared with 51% in the 1965 census. (Ministry of Planning, Man. the Object of Revolution, 1979, 12). This represents a high level of urbanisation for a country with a sizable agricultural sector. In Egypt for example, in 1976 the proportion of the population living in urban areas was 44%. (Central Agency for Public Mobilization, 1977, 13). What is yet more surprising is the rate at which the urban population is increasing. Table 2-1 shows this to have been 5.3% per annum since 1965. In comparison the rural population increased at only 0.9% per annum over the same period. The main conclusion is that Iraq has been experiencing a major internal redistribution of population from rural to urban areas. The main cities are Baghdad, Mosul and Basrah, whose population in 1977 constituted 27%, 9% and 8% of the total Iraqi population respectively. (Ministry of Planning, 1980, Annual Statistical Abstract, 1979, 34).

Iraq Population in 1965 and 1977.

Table 2-1

	Population	1965		1977		Growth rate per annum
		Number (0.000)	(%)	Number (0.000	(%)	
1	Urban Population	4112	50.8	7641	62.8	5.3
2	Rural Population	3935	48.6	4389	36.1	0.9
3	Residents abroad	50	0.6	141	1.1	9.1
	Total Population	8097	100.0	12171	100.0	3.4

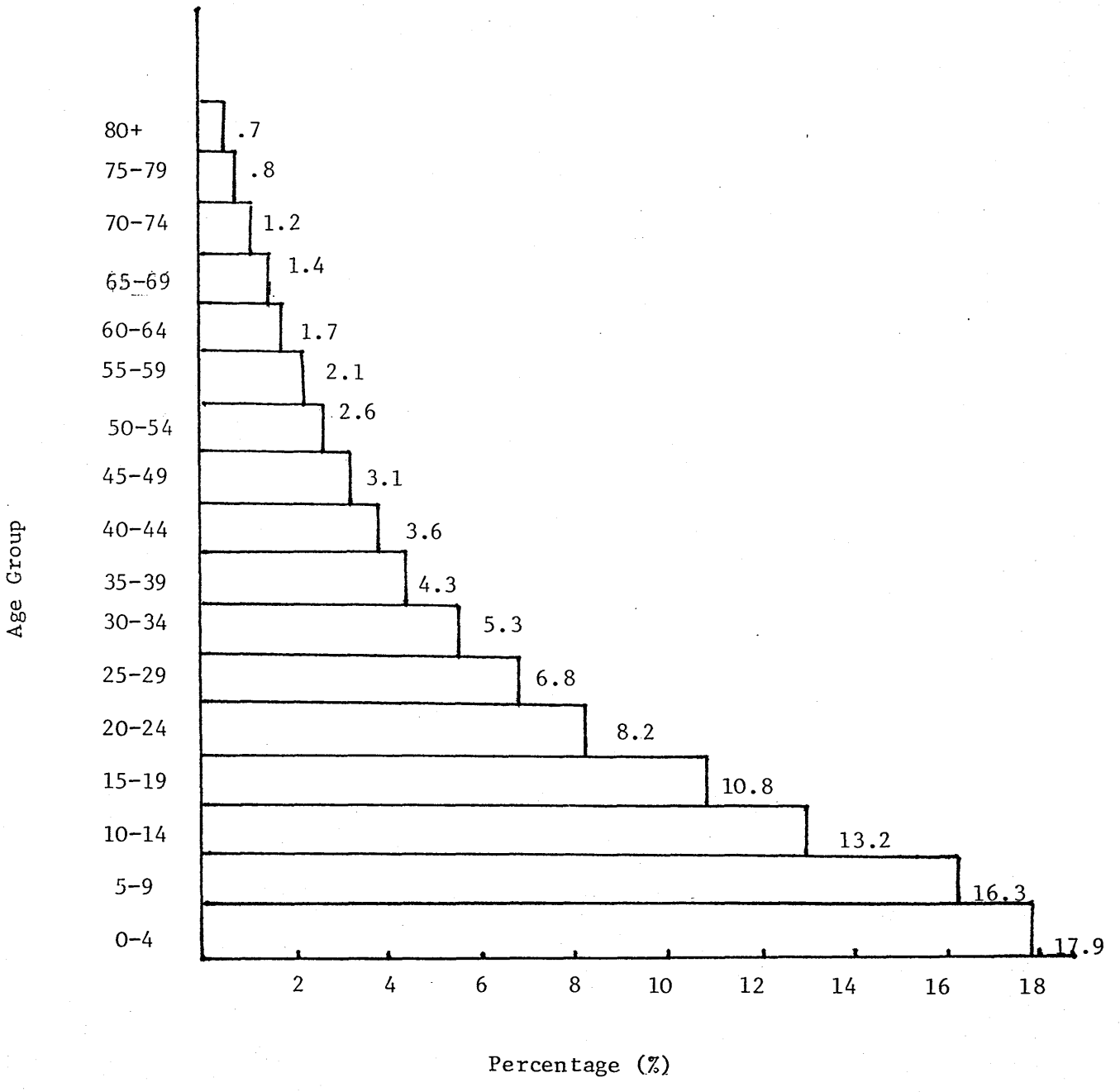
Source: Ministry of Planning, Man The Object of Revolution, (Ministry of Planning, Baghdad, 1979) p.12.

As noted by Birks and Sinclair, Iraq has been experiencing a population "explosion". At present, the crude death-rate per annum is believed to be about 11 deaths per thousand population, and life-expectancy is around 59 years. For the Iraqi population, the crude birthrate is around 42 per thousand population. Accordingly, the population is increasing at about 3.1%. per annum, a rate which will lead to doubling the 1977 population before the end of this century. (Birks and Sinclair, 1982, 245). In common with many developing countries, Iraq's population is young. In 1978 nearly 60% was under the age of twenty, see Figure 2-1: the school age population represents 45% of the total. This fact has a significant effect on the demand for higher education during the next ten years. We will return to this point later. The overall literacy rate is 44% for those persons aged 10 years or over. There is quite a sharp difference in the level of educational attainment between rural and urban areas. As shown in Table 2-2, in rural areas the literacy rate falls to 23% compared with 55% in urban areas. The relatively low incidence of literacy in both rural and urban areas was a major reason for the literacy campaigns which have been mounted since 1978. (For further details about this campaign see Al-Rawi and Qaranba, 1981).

2.4 THE DEVELOPMENT PLANS

In order to understand the main characteristics and specifications of the Iraqi economy some discussion of Iraq's experience in national economic planning is required. Upon the recommendation of the "International Bank for Reconstruction and Development", a Development Board was created in 1951 by the Government of Iraq for the purpose of

Figure 2-1: Distribution of Population by Age Group 1978



Educational Attainment by Area of Residence, 1978

(Population Aged 10 years or over).

Table 2-2 (Percentage)

	Educational attainment	All Country (%)	Urban Areas (%)	Rural Areas (%)
1	Illiterate	56	45	77
2	Literate (Read & write only)	22	26	14
3	Primary School Certificate	13	16	6
4	Intermediate School Certificate	4	5	1
5	Secondary School Certificate	3	5	1
6	Higher Education	2	3	1
	Total	100	100	100
	Total Number (million)	7.56	4.93	2.63

Source: Ministry of Planning (1979), Annual Abstract of Statistics 1978, (Central Statistical Organization, Baghdad).

maximizing the national income from oil and other natural sources, and establishing a national development plan for the period 1952-56. This five year plan of the Development Board called for spending from the year 1952 to 1956 an amount of I.D 150 million which was equal to 7.1% of the annual gross national product over the same period. Most of the expenditure was on industrial and housing projects, while education at all levels received very little attention. In 1953 the autonomy of the Development Board was reduced by legislation which created a "Ministry of Development". (Adam, 1958).

After the revolution of 1958, Iraq's economic future was considered to be dependent upon the political stability of the government. In 1959, the Ministry of Planning was established as a replacement for the Ministry of Development, and the Planning Board was established as a replacement for the Development Board. The first national development plan after the 1958 revolution was the comprehensive plan of 1959-68. Total investments for the plan years was I.D 640 million which was equal to just under 10% of the annual gross national product over the same period. In spite of some instability during those ten years, the government has done a great deal of development on projects in many areas such as agriculture, industry and education.

The major difficulty with planning in Iraq in this period was that the plans were continually being revised and even redrafted before they reached the implementation stage which meant there was a lot of effort wasted. Thus the first 1951/2-55/6 investment programme drawn up by the

Development Board was almost immediately replaced by a second programme for the 1951/2-56/7 period, while the third plan for the 1955/56-59/60 period was superseded by the fourth one for the 1955/6-60/61 period. (Abdul Rassol, 1973, 8). One reason for this was that the oil revenues on which the planned expenditure were based were continually being revised upwards. A further reason for change was the presentation of reports by outside bodies or experts called in to study the country's development prospects, such as that of the World Bank Mission in 1952, which resulted in the adjustment of planning targets, in a first plan. Planners within the country lacked confidence during this period, and outsiders had a respective audience for their suggestions and criticisms. (Wilson, 1982, 219).

The development plans before 1970 anticipated total expenditures of just under I.D 1.9 billion - see Table 2-3. Nevertheless, actual expenditure totalled nearly I.D 960 million (in constant price), an implementation rate of slightly less than 50%. Implementation was broadly goverened by the actual oil revenue allocated to the plan, reflecting in part the close link between oil revenues and economic development, although the link was not necessarily close each year, as we shall see later in this chapter.

The 1968 revolution led by the "Arab Ba'th Socialist Party" brought the country under a new direction and a new age of prosperity. The "First National Development Plan of 1970-75" was drawn up by the government to cover all areas in the country, aimed at improving the welfare of the population and diversifying the economy. This plan

Distribution of Allocated Investments During 1952-1980.

Table 2-3 (Percentage)

	Sector	1952-69	1970-75	1976-80
1	Agriculture	24	21	19
2	Industry	21	30	32
3	Transport & Communication	23	14	17
4	Construction & Building	26	15	17
5	Social Service	6	20	15
	Total	100	100	100
	Total investment (I.D. billion. In constant price)	1.9	2.6	8.5
	Average investment per annum (I.D. million)	105	428	1709
	Percentage increased in average investment per annum	100	408	1628

Source: Percentages in this table were counted from the real figures in the following references:

(1952-75) Hashim, J. (1975), Development Planning in Iraq, Historical Perspective and New Directions, in Arabic (Planning Board, Baghdad).

(1976-80) Ministry of Planning (1978), The National Development Plan, in Arabic (Ministry of Planning, Baghdad).

involved I.D 2.5 billion. The 1970-75 plan marked a large increase in total investments devoted to the social service sector both in the proportion of total investment and in real terms. The proportion of investments allocated to the service sector increased from only 6% over the period 1952-69 to over 20% during the plan of 1970-75. (Ministry of Planning, 1974). In real terms the average investments in the service sector increased from only I.D 6 million per annum to I.D 90 million per annum over the same period (in constant price). This was intended to fulfil the basic objectives of economic and social policy laid down by the leadership of the Ba'th party to improve the health and education services, as we shall see in the following section.

The latest data available refers to the "Second National Development Plan of 1976-80" which represents further large increases in the total expenditure to I.D 8.5 billion (in constant price). This was more than a three-fold increase over planned investments in 1970-75, and more than a four-fold increase over planned investments in 1952-69. Moreover, the actual expenditure during the 1976-80 plan was over 78% of the total planned allocation compared with 67% of the 1970-75 plan, and 50% of the 1952-69 plans. The percentages at least show some indication of a noticeable improvement in the latest period. This improvement was mainly due to:

1. Increased oil revenue in the government deposit, as we shall see in the next section.
2. Increase in accumulated experiences for the Iraqi planners, which made the targets laid down by them more clear, both in quantitative and in qualitative terms.

3. The efforts made by the political authorities to follow up the actual implementation of the plan annually.

The distribution of the allocated expenditure for the 1976-80 plan is shown in Table 2-3. This plan again gave priority to the industrial sector. It is interesting to note that the large industrial projects dominate the 1976-80 plan, which were grouped into nine sets of projects - petroleum (including oil fields, pipelines, oil and gas plants, petroleum equipment), petrochemical, chemicals and glass, metallurgical and light industries, paper and textiles, electricity, vehicles and auxiliary equipment, food stuffs, and building materials. These projects increased the proportion of the allocated investments to the industrial sector by about one-third of the total investments for the 1976-80 plan, which was equal to I.D 2.7 billion. (Ministry of Planning, 1978, The National Development Plan 1976-80).

Among other strategies the government has given due consideration to education - to create an educated and skilled population. The 1976-80 development plan defined the strategic factors of skilled manpower and education as follows:

> "That there should be....realization of full employment and creation of work opportunities, ensuring the full and best performance of the human factor, augmenting skills among labour to meet the requirements of the plan". (Ministry of Planning, 1978, The National Development Plan, 1976-80).

Some obvious achievements of this strategy during the 1970s are:-

1. The number of engineers graduating from engineering schools has increased from just under 700 in 1970 to over 3000 in 1980.

2. The number of graduates from technical institutes has increased from 340 to over 7500 during the same period.
3. The number of medical graduates has more than doubled during the same period, which was an increase from 300 to just under 650. (For more details about other achievements see Ministry of Information, 1980).

The greater part of financial resources for the development plans came from oil revenues. During the last three decades the average share of oil revenues in the total financial allocations of the development programmes was between 70-95%. This illustrates the dramatic dependence of economic development on oil revenues (Ahmad, 1978, 98). Such large investments during the last decade, especially in the industrial sector, will probably reduce the dependence of economic development on oil revenues during the next decade.

It is useful to conclude this discussion about the development plans by the following comments stated by Wilson:

> "Planning has advanced considerably in Iraq over the last thirty years, and the machinery itself is certainly adequate. Much useful research has been carried out within the Planning Ministry, and the projects implemented are concrete examples of the achievements made. Productivity has improved considerably within the state sector, and the waste resulting from underutilized capacity has been significantly reduced. Overall the approach to planning remains partial, however, it would be erroneous to describe Iraqi planning as comprehensive. Planning is, of course, only a means, not a goal in itself, and comprehensive planning may be neither necessary nor desirable in the Iraqi context". (Wilson, 1982, 239).

However, the important question is what are the achievements of those plans to the economic sectors and then to the Iraqi people. It is

not easy to explain all the achievements during the last two decades in these few pages. However, it is interesting to cite here some of the most obvious as follows:

1. The national income per capita increased from U$ 258 in 1960 to U$ 302 in 1970 (or only by 1.5% per annum), and increased to U$ 1631 in 1980 (or by 18.5% per annum) in constant prices.
2. Average growth of national products between 1960-70 was 6.1% per annum, increased to 12.1% between 1970-80. (World Bank, 1984, 113).
3. Remarkable improvements have been achieved during the last two decades in the health services. The main results of such improvements are shown in Table 2-4.
4. The proportion of the urban population receiving pure water supplies has increased from 65% (or 2.7 million) in 1968 to 90% (or 6.8 million) in 1980. The proportion of the rural population receiving pure water has increased from less than 14% (or 0.6 million only) to 70% (or 2.8 million) in 1980, i.e. the proportion of all Iraqi population receiving pure water supplies has increased from 41% (or 3.3 million) in 1968 to 82% (or 8 million) in 1980.
5. The consumption of electric power has increased five-fold between 1968-80, from 150 kilowatts per person to 738 kilowatts.
6. The length of modern roads has increased from 4500 k.m. in 1968 to 12000 k.m. in 1980.

More details about other achievements will be explained in the following sections.

Some Achievements of the Development Plans 1960-80

Selected Indicators in Health Sector.

Table 2-4

	Indicator	1960	1980
1.	Life expectancy at birth (years) - Male	47	57
	- Female	50	61
2.	Child death rate (aged 1-4) per thousand pop.	28	8
3.	Crude death rate per thousand population	20	11
4.	Population per physician	5280	2190
5.	Population per nursing persons	3030	1890

Source: The World Bank (1984) "World Development Report-1984", (published for the World Bank, Oxford University Press, New York) - different tables.

2.5 THE OIL SECTOR

Oil production in Iraq started in 1927. It grew slowly until 1945. Between 1945 and 1960, oil production and exports grew rapidly; production increased from 5 million tons in 1945 to 48 million tons in 1960. (Richard, 1982). The Iraqi Petroleum Company (IPC) was owned by a Western foreign company. The shareholding composition of the company was 23.75% each allocated to BP, Royal Dutch/Shell, Compagine Francaise des Pe'troles, and Near East Development Corporation (Jersey Standard/Mobil) - U.S.A. and 5% to Participations and Explorations Corporation. (E.I.U. 1980, 29).

After the 1958 Revolution the government's attitude towards the Iraqi Petroleum company had altered sharply after the latter unilaterally reduced the posed price for Middle East Oil. A lower posed price significantly diminished government revenues. Negotiations with the Iraqi petroleum Company (IPC) had begun in early 1959. In addition to the price issue, the Iraqis began to raise fundamental points such as return of unexploited concession areas, and the Iraqi ownership in IPC. Negotiations broke down in October 1961. In December 1961, the government enacted Law No. 80 of 1961 which expropriated all the IPC group's concession areas that were not in production. The tension between the government and the IPC continued for about a decade. As a consequence of the dispute with IPC, growth in oil production during the 1960s averaged 5% in Iraq against an average of 10% for the Middle East region as a whole. (E.I.U. 1980, 30).

After the 1968 Revolution the IPC again began to decrease oil exports from the Iraqi oil fields. Negotiation between the Iraqi government and the IPC resumed in January 1972. A vast gap still existed between the two sides, and after four months negotiations were broken off again. In June 1972, the original IPC fields were nationalized. (Ministry of Oil, 1974, 6). A "state-owned company for oil operations" was established to operate the facilities. Oil production has steadily increased since nationalization. Production in the period 1970 to 1975 increased on an average of 7.8%, above the regional average of 7.1%. In the five years to 1980, Iraqi oil production increased by an annual average of 8.7%, while the regional average dropped by 0.2% (E.I.U., 1980, 30). Trends in Iraqi oil output are shown in Table 2-5.

Oil revenues increased continuously and much quicker than production, as a result of the price increase implemented by the OPEC countries after 1971. Between 1971 and 1973 alone oil revenues more than trebled; it increased from U$ 1.8 billion to about U$ 5.7 billion. The government announced that in 1977 oil revenues in the government deposit amounted to the equivalent of U$ 9.6 and still increasing, as shown in Table 2-5.

Oil Production and Revenues,

Selected Years.

Table 2-5

Years	Production (in millions of metric tons)	Revenues in U$ dollars (millions)
1972	0.8	0.8
1935	3.8	4
1940	2.8	9
1945	4.9	13
1950	6.9	19
1955	31.2	162
1960	37.8	266
1965	61.7	353
1970	76.0	521
1975	110.9	7500
1977	115.0	9600
1979	169.3	12180

Source: Based on information from Organization of Petrol Export Countires (1976).

- Annual Statistical Bulletin, (OPEC, Vienna) Tables 15 an 101.
- Middle East Economic Digest, London, October 6, 1978, p.29.
- Middle East Economic Digest, London, December 3, 1979.
- Provisional figure from Economic Intelligence Unit Speical, Iraq: A New Market in a Region of Turmoil (EIU, London, 1980) Report No. 88, p.21.

The development of oil is seen as the key to wider economic development which is evident from the scale of Iraq's development plans, and the extent to which those plans depend on oil production to provide the necessary finance, as we mentioned earlier in the previous section. By the mid 1970s the oil industry accounted for over 50% of the gross domestic product (GDP); for about 80% of budget revenues and for over 90% of foreign exchange earnings. The sharp increase in oil revenues and in GDP after 1973, following the nationalization of the oil wealth and the increase in oil prices, turned Iraq almost overnight from a poor developing country into one much richer in terms of per capita GDP. This increased from I.D 144 in 1973 to I.D 554 in 1980 in constant price (equivalent to U$1818 in 1980 exchange rate - for details see Ministry of Information 1980, 40). Nevertheless, time and change were needed to transform the sudden boost in revenues into buildings, machinery and trained people.

2.6 THE INDUSTRIAL SECTOR

Since independence in 1958 manufacturing has been a fast growing sector, partly because it started from a very low base. Under Ottoman rule industry consisted almost entirely of handicrafts, artisan shops and animal-powered activities. Between World War I and World War II larger scale manufacturing began, stimulated in part by the construction of roads and the availability of electric power in urban centres. (Langley, 1966). The pace of industrialization accelerated after the early 1950s, largely financed by the growth in oil revenues.

By the late 1960s industry, other than oil, was based primarily on agricultural products and such easily processed natural resources as rock, sand, and non-metallic minerals for construction materials. Other natural resources that had been discovered included salt, phosphates, and some iron and copper ores in addition to oil and natural gas. (Penross, 1979).

In the decade after the 1968 revolution and the Ba'th party's coming to power, considerable effort was made to improve the performance of manufacturing. The public sector was re-organized, creating by 1978 some ten semi-independent state organizations for such major subsectors as spinning and weaving, chemical and engineering industries. (Ministry of Information, 1980). In spite of the legacy of severe backwardness inherited by the industrial sector during the 1960s, the 1968 revolution has been able to achieve remarkable results by completing projects already started and putting them into operation. Such projects include paper manufacture, sulphur mining, the making of agricultural implements, artifical silk...etc. (Ministry of Planning, 1978, The man...., 63). As a result of these efforts the value of industrial production at constant prices (which did not exceed I.D 241 million in 1968) rose to about I.D 516 million in 1976, that is an increase of about 114%. (Ministry of Planning, 1978, the man..., 54).

The 1976-80 plan projected an annual average real growth rate of 17.8% for the value added by mining and manufacturing (including oil) over the plan years. The main objectives of this plan for the industrial sector were :-

1. The creation of an economic surplus to enable the industrial sector to play an effective role in financing the investments of the development plans.
2. Developing industries to process raw materials and agricultural products and participation in the diversification of the structure of output and exports.
3. Fulfilling the growing needs of the local market for industrial goods for both production and consumption in all sectors, aiming for local industrial production to replace goods imported from abroad. (Ministry of Planning, 1978, the man..., 56).

The development plan for the years 1976-80 provided a total I.D.2.7 billion for the industrial sector, which came to 2.5 times the total allocation of the period 1959-1975. The outstanding aspects of the industrial development in 1980 may be indicated as follows :

1. The relative importance of the industrial sector in total domestic production increased from 43% in 1970 to 73% in 1980 (including oil).
2. The role of the socialist (public) sector in national industry has increased substantially. Its share of industrial production rose from 11% in 1970 to nearly 95% in 1978.
3. The role of the Industrial Bank - owned by the state - has been increased in the provision of needs of investment finance to the private and mixed sectors. The total credit facilities and loans granted by the Bank has increased from about I.D 2 million in 1970 to over I.D 40 million in 1979 in current price. (Ministry of Information, 1980).

4. The total capacity of Iraqi oil refineries has increased from under 5 million tons in 1970 to over 20 million tons in 1980.
5. The production of cement has rised from 1.5 million tons in 1970 to 6.3 million tons in 1980.
6. Electricity generating capacity has increased from 650 megawatts in 1970 to 4000 megawatts in 1980, which is a six-fold increase.

The above achievements represent some of many others which occurred during the 1970s. However the implementation of the industrial plans faced many difficulties during the last decade. In spite of higher growth rates of manufacturing output in 1970s, (which was over 10% per annum), experts still questioned how much improvement had been achieved in the management of the industrial sector. Observers noted a strong influence of bureaucracy and a reluctance to make decisions. These practices impeded the operations of government-run enterprises in obtaining materials at the proper time or in responding to changes in market conditions. (Penrose, 1978, 252). Social legislation made it nearly impossible to lay off workers or to transfer labour where it was most needed, resulting in considerable overstaffing in public sector industry. Government officials acknowledged considerable waste in unused capacity, overstaffing, overstocking of inventories, and lost production time because of shortages or disruptions in supply. Pricing decisions were made by the state organization, and were subject to ministerial approval, giving the enterprises very little flexibility to meet market conditions. (Townsend, 1982, 258).

It should be emphasized that the above applied to industry in Iraq some ten years ago, at a time when the process of state control was still evolving. A great change has taken place since, in order to improve the performance of manufacturing. Factory managers are given more autonomy, and efforts are made to hold them responsible for meeting goals, and more incentives are given to workers to increase their productivity.

2.7 THE AGRICULTURAL SECTOR

Since the beginning of recorded time agriculture has been the primary economic activity of the Iraqi people. Although the value of farm production had been overshadowed by other sectors, particularly the oil industry, even in 1966 over half of the labour force was employed in agriculture (Birks, 1982, 241). In 1980 agriculture's share of GDP was only 7% against 17% in 1960. (The World Bank, 1984, 115). Nevertheless the government planner and foreign experts believed that farming had a considerably greater potential than was being realized. In policy-making, the agricultural sector had always been accorded high importance. It is regarded as the "future oil" of Iraq.

During the 1970s two main targets were stated for the agricultural sectors:-

1. To support the policy which requires the creation of new economic resources to raise national income and reduce dependence on oil as the main source providing the needs for development.

2. To protect the national independence of the Iraqi region and the Arab nation in view of the fact that food supplies are one of the instruments used by the monopolistic powers to exert pressure on other people and influence their policies. (Ministry of Planning, 1978, The man..., 44).

A number of steps have been taken to achieve these targets and to modernise this sector from institutional reforms to technical improvement. Among them are :

1. Increase the total investments allocated to the agricultural sector from under I.D 0.6 billion over the period 1952-69 to I.D 1.6 billion (in constant price) over the years 1970-1980.
2. Loans provided to farmers by the "Agricultural Co-operative Bank" increased from under I.D 2 million in 1970 to about I.D 18 million in 1979 (in constant price).
3. The number of tractors and harvesters used in this sector increased from under 10,000 in 1970 to over 30,000 in 1980. (Ministry of Information, 1980).

In spite of all government investments aimed to develop this sector, the output of the major agricultural products during the 1970s fell, as shown in Table 2-6. Many reasons are behind this deterioration, such as soil salinity and lack of drainage investments on the physical side, low prices, inadequate development of marketing and credit functions of the co-operatives on the institutional side. Another distinguishing feature is demographic - the mass migration from the countryside. By one calculation, the number of persons employed in

Major Agricultural Outputs in 1972 and 1979.

Table 2-6 (Thousand tons)

Agricultural Crops		1972	1979	Changes (%)
1	Wheat	2465	1492	-39%
2	Barley	859	872	+ 2%
3	Rice	315	284	-10%
4	Cotton	23	11	-52%
5	Dates	450	389	-14%

Source: F.A.O. (1980) Production Yearbook, (F.A.O., Rome).

agriculture decreased from over 1.5 million in 1973 (which represented 54% of total labour force) to 944,000 in 1977 (which constituted only 30% of total labour force), and still doing so. (Stork, 1982, 34).

The performance of Iraqi agriculture seems to be explained by the following observation made in the context of the Middle East states:

> "An expanding population, regionally between 2.5% and 3.5% per annum, has served to increase pressure on domestic food stock. Per capita food production registered a sharp decline in several countries of the Middle East state from 1966 to 1975". (Balam, 1981, 145).

In the Iraqi case there is an additional factor which adds more difficulties for the agricultural production to meet the demand - that is the sharp increase in the national income per capital (which was increased by more than five-fold during the seventies) from I.D 111 in 1970 to I.D 554 in 1980 in constant price. On the other side the government made it unprofitable for the farmers to respond to this increase in demand by fixing the prices for most agricultural outputs over the seventies, when inflation was about 10% per annum. This has put the burden for meeting rising demand for foodstuffs on imports (mostly subsidized by the government) which have more than doubled since 1977 and stood at U$ 1.4 billion in 1980. This is more than the total value of Iraqi agricultural production in that year, according to the Ministry of Planning forecasts (E.I.U. 1980, 3-13).

The difficulties in developing the agricultural sector is world-wide as was stated by some observers:

> "It should be pointed out to those, both inside and outside Iraq who have regretted the country's slow progress in the agricultural sector, that the modernisation of the countryside is a complex and invariably protracted process. We would remind them that a residual peasant economy, and all that signifies, survived in certain countries in Western Europe until well after World War II". (Theobald & Jawad, 1982, 215).

It should be emphasised that a major problem for Iraqi agriculture is not just a shortage of skilled manpower but of motivated skilled manpower. In Iraq, as elsewhere in the developing world, the shortage of trained personnel is exacerbated by the unwillingness of those with appropriate skills to reside in rural areas where the availability of educational, medical, recreational and other facilities is generally inferior to that in the cities.

2.8 THE LABOUR FORCES

In 1968 the labour force, estimated at 2.3 million, increased to 3 million in 1977. (Ministry of Planning, 1978, The man....). This represents about 26% of the total population in both years. The distribution of Iraqi's labour force in 1968 clearly reflected the dominance of agricultural employment. More than half the total workforce (54%) were employed in agriculture and fishing, as shown in Table 2-7. By 1977 a dramatic change had occurred in the distribution of the labour force. Agricultural employment had decreased both in absolute terms (from 1.5 million in 1968 to 0.9 million in 1977), and as a proportion of total employment (from 54% to 30% during the same period). The building and construction sector had burgeoned, but the greatest increase was in community, social and personal services. The latter sector accounted for about 32% of all employment in 1977, compared with only 23% in 1968.

Employment by Economic Sector, 1968 and 1977.

Table 2-7

	Economic Sector	1968		1977		Changes (%)
		Number (thou-sand)	(%)	Number (thou-sand)	(%)	
1	Agriculture	1254	54.0	943	31.5	-25
2	Industry	174	7.5	344	11.5	98
3	Construction	66	2.8	322	10.7	388
4	Distribution & Transport(*)	280	12.0	433	14.4	38
5	Personal & Community services	550	23.7	958	31.9	80

Source: Ministry of Planning (1978), Man: The Object of Revolution, (Ministry of Planning, Baghdad, p.15).

(*) Including transport and communication, storage, financing insurance, real estate, and business services.

It is interesting to note that Iraq enjoys such a large service sector for two main reasons. First, Iraq is a country run along socialist lines, with a planned economy. Its government exerts a direct control over the economy and therefore has an unusually large requirement for civil servants. Second, the informal sector in urban areas has proliferated in recent years. Not enough employment opportunities have been created by Iraq's modern industrial sector to absorb all the new arrivals in towns and cities. Many of these new arrivals are untrained and illiterate, so are not suitable for employment in Iraq's modern industrial development. It seems likely that a sizable proportion of Iraq's service sector employment consists of activities which are not particularly productive. This either results from the lack of other productive employment opportunities or, in the case of the oil-rich countries like Iraq, from the government's attempt to create new jobs in the civil service sector as a means of distributing income and employment. (Birks, 1982, 248). It is the view of the author that raising productivity and changing the nature of employment in the service sector, is a major challenge to government in the next ten years.

As we noted in Table 2-7, employment in agriculture has declined, the biggest expansion being in the service, industry and construction sectors. In the industrial sector, however there is a duality - on the one hand there are large scale establishments which were nationalized in 1964. These were modern enterprises and much of the investment in these firms has been capital intensive with a low rate of absorption of labour, especially unskilled labour. On the other hand, there are private small scale industries and handicrafts with a lower level of

technology and low productivity. Therefore a significant proportion of the labour force in the industrial sector might be underemployment. Although unemployment was not a problem in the late 1970s, due to the government policy to secure jobs for everyone, underemployment was a problem, the extent of which was unclear. Observers usually noted an overstaffing in government offices and public sector enterprises. It is obvious that financing such policies depends certainly on oil revenues which have fluctuated sharply in the last ten years. Though the author believes that the creation of a sufficient number of jobs for labour market entrants in the next decade will not be easy, we will probably see the emergence of open unemployment and underemployent as key problems facing the Iraqi planners in the next few years.

The proportion of women in the labour force was still low in 1977, 17% of the total workforce. (Birks, 1982, 248). The highest proportion of women worked in the agricultural sector. Two-thirds of the total female labour force worked in this sector, representing one-third of the total labour force working in this sector. The number of women employed by the government increased sharply in the 1970s, more than doubling between 1968 and 1977. The traditional position of women (as housewifes only) was changing, and the bulk of them worked in education and medical services.

In 1968 the number of university degree holders in the labour force totalled 33.7 thousand or less than 2% of the total. (Ministry of Planning, 1977, Manpower Distribution....) It increased to 93.6 thousand in 1975, just over 3% of the total, and is estimated will be 250,000 in 1985. As Table 2-8 shows, the

Employment of High Level Manpower(*) by Economic Sectors in 1965 and 1976.

Table 2-8 (Percentage)

	Economic Sector	1965	1976
1	Agriculture	7.1	8.1
2	Industry	13.2	13.7
3	Construction	3.5	3.7
4	Transport & Communication	5.2	3.1
5	Services	62.6	64.5
6	Other	8.4	6.9
	Total (%)	100.0	100.0
	(No.)	33700	93600

Source: Ministry of Planning (1977), Manpower Distribution by Level of Education 1965 and 1976, (Ministry of Planning Social & Educational Department, Baghdad).

(*) Highly qualified manpower represents those who hold post-secondary certificate.

service sector constituted two-thirds of the total high level manpower in 1975. The largest number of them were teachers (41%).

Unemployment among unversity graduates appeared in the mid 1960s. No official figures about their number is available. An unofficial guess was about 2000 in 1969 (or about 4% of the total educated labour force). This figure rose to 6000 in 1973. (Nyrop, 1982, 212). In spite of a large number of them being art and social science graduates, however, there were many engineering and other science graduates - for instance physicists, agriculturists...etc. This 6000 was equivalent to 35% of total university graudates who graduated between 1969-73 (Unesco 1970 to 1974, different tables). At the same time this 6000 represents about 9% of total educated manpower in 1973. It is relatively high compared with other developing countries, like Pakistan, which was about 6% in 1971-1972. (Rado, 1976, 32).

In order to avoid massive unemployment among university graduates, the government intervenes. Jobs were guaranteed to all university graduates, the government took the decision to recruit all unemployment graduates in 1974. (Al-Wagay, Official Decisions, 1974). This forced the government to expand the number of non-productive jobs in the service sector and in government administration to absorb those graduates.

2.9 SUMMARY

The materials presented in this chapter give a brief review of the main features of the Iraqi state. The economy of Iraq has made

spectacular progress after the 1968 revolution. Several important changes with far reaching effects have taken place, such as the nationalization of foreign oil companies, and the increase in oil revenues. Accordingly the national income per capita increased five-fold during the 1970s (or from U$302 to U$1631 in constant prices.) Although the government remains firmly committed to the goal of agricultural modernization, and to invest in this sector, the industrial sector continues to be given priority, in terms of the total investments in this sector which constituted about one-third of total national plan investments.

In view of the enormous resources and potential in Iraq for development, future commentators may well see the present era as only the beginning of Iraq's modern economic development. Currently, however, the economy is oriented towards a relatively traditional agricultural sector and is highly dependent on oil extraction and production. Diversification of the economy both into new sources has income and towards a more sophisticated exploitation of resources has yet to be accomplished.

Iraq has shown a very judicious use of its foreign exchange resources in comparison to other oil-rich countries. Foreign exchange has not been drained of importing luxury consumer goods. Expenditure on investments in all economic sectors has increased. The development of human resources in general, and high level manpower in particular, shall be an important determinant of future development in Iraq, as we shall see in the following chapters.

CHAPTER 3

THE DEVELOPMENT OF THE EDUCATION SYSTEM IN IRAQ

3.1 INTRODUCTION

This chapter is intended to provide a proper background and a general perspective about the development of the educational system in Iraq. This could help to interpret the findings of the study. This chapter will be divided into three main parts. The first part will be devoted to tracing the development of the general education system, which includes primary, secondary and vocational education. The second part will examine the general trends and problems of higher education systems in Iraq, its evolution and development. This attempt aims primarily to diagnose the problems of higher education and their relation to national need for qualified manpower.

In part three, the establishment of the University of Technology (UOT) will be discussed as well as its objectives and curriculum. The author believes that those aspects are important to give a brief account about the major environmental factors surrounding the preparation of the UOT graduates who represent the sample of the present study.

3.2 GENERAL EDUCATION SYSTEM

This part will describe the historical development of the general education system (*) in Iraq, in particular, trace its origin, development and the changes that occurred during this century. We will then explain the present structure of the general education system as well as the quantitative growth, in order to give a brief idea about the development of this system and its effects on the higher education system.

(*) The "general education system" will be used in this study to refer all educational level before higher educational level.

3.2.1 Historical Development

When the modern state of Iraq was formed in 1921, the educational system was extremely narrow. The old Ottoman provinces of Baghdad, Mosul and Basrah, which form the Iraq of today, had only been slightly affected by the cultural revival witnessed by some other Arab provinces of the Ottoman Empire in the nineteenth century. Modern schools were extremely few in number, and access to them was limited to a very small wealthy elite. Traditional education was provided for by traditional religious institutions basically in the form of the "katatib" (elementary school) at which small children received basic religious education by a "mulla" (Al-Hilali, 1959). In spite of their primitiveness and unsuitability, the "katatib" continued to serve as the principle centre of primary education until the end of the Ottoman rule and the passing of the country into British hands after World War I.

Despite the existence under the Ottomans of a few government schools, together with the "katatib" and some foreign and private missionary schools, the percentage of literacy did not exceed 0.5%. During the 1920s, under the British mandate, the organized public schools were established and expansion began slowly in the major cities (Al-Rawi, 1971, 208). The period between the British occupation in 1918 and the 1958 revolution witnessed some important developments on the educational levels. The "katatib" gradually gave way to public primary schools. By 1958 only two organized "katatib" remained. The relative expansion in primary education, however, was unable to match the increase in the population. Thus, the percentage of illiteracy registered in 1957 was 82%, ranging from 92% in rural areas to 63% in urban centres, and from 92% among women to 72% among men (Jasim, 1977, 16).

A turning point came after the 1958 revolution. Since then education in Iraq has been increasing noticeably every year, and within ten years (1958-68) the number of schools, students and teachers increased by 121%, 153% and 213% respectively, (Ahmed, 1978, 99). However, the main problems facing the educational system during this period were insufficient school buildings and a low standard of teachers, especially at primary level, (Al-Khafaish, 1977, 46). Most of the teachers at primary level were poorly trained and had reluctantly been "chosen" for this profession. Some of them who attend the two-year institutes (after completing secondary school) do so for economic reasons, and others just because their score at the end of secondary schooling was not high enough for admission to the university of their choice, (Al-Khafaish, 1977, 46).

Another turning point in the education system in Iraq came after the 1968 revolution, when significant changes occurred in the educational policies for the new government. The legislative basis which laid the guidelines for educational policies in the 1970s was set by three laws. An "Illiteracy Eradication Law" was promulgated in 1971. This was followed by a "Free Education Law" in 1974, whereby the state undertook the responsibility of covering all financial costs at all educational stages from kindergartens to universities. In 1976 a further "compulsory education law" was passed making primary schooling compulsory for all children between 6 and 15 years, and committing the state to provide all the necessary facilities. Accordingly, a remarkable growth in the number of schools, students and teachers took place during the period 1968-1978, as shown in Table 3-1.

Growth of the Number of Schools, Teachers and Student at General Education in Iraq, Selected years.

Table 3-1

Number of:-	1958	1968	1978	Growth (%)	
				1958-68	1968-78
Schools	2242	4962	12614	121	154
Teachers	17465	54714	119219	213	118
Students	505694	1280260	33731333	153	163

Scource: Figures for the years 1958 and 1968 compiled from:- Sabie, A., (1978), Industrial Manpower Needs in Iraq with Implications for Industrial Education, (unpublished, Ph.D. Thesis, University of Missouri-Columbia).

Figures for the year 1978 compiled from:- Ministry of Planning (1978), Annual Abstract of Statistics 1978, (Central Statistical Organization, Baghdad), pp.218-238.

The expansion of the educational system, however, necessarily focussed exclusively on the school age group. As Table 3-2 shows, the total number of students at all educatonal levels rose seven-fold, while the population of school age (6-22) increased by less than three-fold. The enrolment ratio at all educational levels compared with the school age population had increased from 23.6% in 1957 to 67.8% in 1980.

On the basis of the material available about the growth of the general education system in Iraq during the 1970s, as shown in Table 3-3, some observations can be made regarding the effectiveness of such growth, as follows:

1. The growth in the number of teachers did not keep pace with the growth in student numbers at all educational levels. Accordingly, the teacher/student ratio deteriorated from 1:18 to 1:23 in kindergartens, from 1:23 to 1:28 in primary schools, from 1:25 to 1:32 in secondary schools, and from 1:9 to 1:14 in vocational schools. Teacher qualifications, however, have been improving. The proportion of teachers in primary schools who have a "Teacher Training Institution Certificate" (Higher Education) was 35% in 1980 compared with 18% in 1970, and the remainder completed teacher training school, which is equivalent to secondary school with special concentration on teaching methods. At secondary schools all the teachers in 1980 had university certificates compared with 78% in 1970.
2. There has been significant progress in vocational education. The government concentrated on developing vocational schools to meet the acute shortage of skilled labour. As a result of this policy total students enrolled increased five-fold. The proportion of

Growth of Population and Enrolments at all Educational Levels by 1957, 1970 and 1980.

Table 3-2

Population & Enrolments at all Educational Levels	1957	1970	1980
A. Enrolments: (Thousand)			
Primary	416.6	1200.0	2608.9
Secondary	51.5	317.1	970.7
Higher Education	5.1	40.1	98.4
Total Enrolments	473.2	1557.5	3678.0
B. Percentage of Enrolment to age group: (%)			
Primary (6-12)	43	77	98
Secondary (13-18)	8	30	56
Higher Education (19-22)	1	6	10
Percentage of Enrolments to age group (6-22)	24	47	68

Source: Ministry of Higher Education (1981), Final Report of the Second Conference for Developing Higher Education Systems, in Arabic (Baghdad University Press, Baghdad, Report No. 3).

Growth of General Education in Iraq (1970-1980)

Table 3-3

	Educational level	1970	1980	Increase (%)
1	Kindergartens			
	(a) Schools	124	358	189
	(b) Teachers (thousand)	0.74	3.08	304
	(c) Children (")	13.5	70.4	423
2	Primary			
	(a) Schools	5617	11316	101
	(b) Teachers (thousand)	49.6	92.6	87
	(c) Students (")	1200	2609	117
3	Secondary			
	(a) Schools	921	1774	93
	(b) Teachers (thousand)	12.3	28.0	127
	(c) Students (")	306	917	199
4	Vocational			
	(a) Schools	52	126	142
	(b) Teachers (thousand)	1.1	3.9	142
	(c) Students (")	10.9	54.0	394
5	Total			
	(a) Schools	6714	13574	102
	(b) Teachers (thousand)	63.8	127.7	100
	(c) Students (")	1530	3650	151

Source: Ministry of Planning (1978) Annual Abstract of Statistical 1978 (Central Statistical Organization, Bahgdad), pp.218-238.

students enrolled in vocational schools compared with those in secondary schools (excluding students in intermediate schools) increased from 12% in 1970 to 25% in 1980. The government target is to reach 50% in 1985 (Ministry of Planning 1978, National Development Plan 1976-80).

3. The proportion of females enrolled compared with total students enrolled increased from 29% to 41% during the same period. This indicates a movement towards equal opportunities between males and females, particularly in kindergartens and primary schools. Nevertheless there are still significant variances in the proportion of females at all other educational levels, which indicates that females are still under-represented at the latter levels, as shown in Table 3-4.

It must be admitted that the above observations represent a tentative conclusions which can be reached from the data available for this study, and the full effect of growth in the general education system on economic production will only become apparent in the long-term and needs more time and effort to make reliable judgement. Research in other parts of the world has sought to quantify the effects of general education on levels of production. In the United States it has been suggested that 21-29% of increases in productivity are attributable to rising standards of education; in Japan 27% of productivity increases have been attributed to education; in the Soviet Union the productivity of a worker who has completed elementary school education has been estimated as being equivalent to one and a half times that of an illiterate worker of the same age and function (Alies, 1982). Such studies are badly needed in Iraq in order to develop some quantitative aspects of the general education system in future years.

Proportion of Female Students in General Educational Levels.

Table 3-4 (Percentage)

	Educational Level	1970	1980
1	Kindergartens	43	47
2	Primary	27	45
3	Secondary	29	31
4	Vocational	22	28
	Total	28	41

Source: Ministry of Planning (1978) Annual Abstract of Statistics - 1978 (Central Statistical Organization, Baghdad) pp.218-238.

3.2.2 Present Structure of the Education System

The school system in Iraq begins with kindergarten at the age of 4. Kindergarten lasts for two years, but is not universal. It is available to only 15-20% of the 4 year old population, and mainly in the big cities. The first school for most children is elementary school which begins at 6 years old and lasts 6 years. There is compulsory school law which decrees that all children at the age of 6 will attend elementary school. This law has been in existence for many years, but the academic year 1978 was the first year in which the law had been strictly enforced (Ministry of Planning, 1979, Man, The Object of Revolution). The goal at this stage is to enable children to gain substantial essential knowledge in reading, writing and simple principles of natural and social sciences.

After elementary school, the students used to take a general exam, that is an exam administered by the Ministry of Education and rated in Baghdad by the Central Committee. If a student fails this exam, he would not be accepted at any secondary school. He could, however, repeat the sixth year of the elementary school, but he could only do this once.

The student goes to intermediate school at the age of 13 and is there for 3 years. After intermediate school there is a general exam. If he fails this exam, he repeats the third year only once, and if he passes he may go on to secondary school. Secondary schools are either academic or vocational. Students passing out of intermediate schools with higher grades go on to academic secondary school, those passing

with lower grades go to vocational schools. The secondary school in both academic or vocational streams is a three year school.

The first year at the academic secondary school is general and in the second year the student decides whether or not he is going to concentrate on science or literature (or art). At the end of the third year, the student takes a "Central Ministry Exam". If the student has gone to a vocational school, there are three types to choose from - (1) industrial, (2) agricultural, and (3) commercial. The final exam from a vocational school is also a "Central Ministry Exam". This exam is considered equal with the academic school certificate, but the holder of a vocational school certificate cannot go on to university, unless he passes out of school in the top 5% in the country.

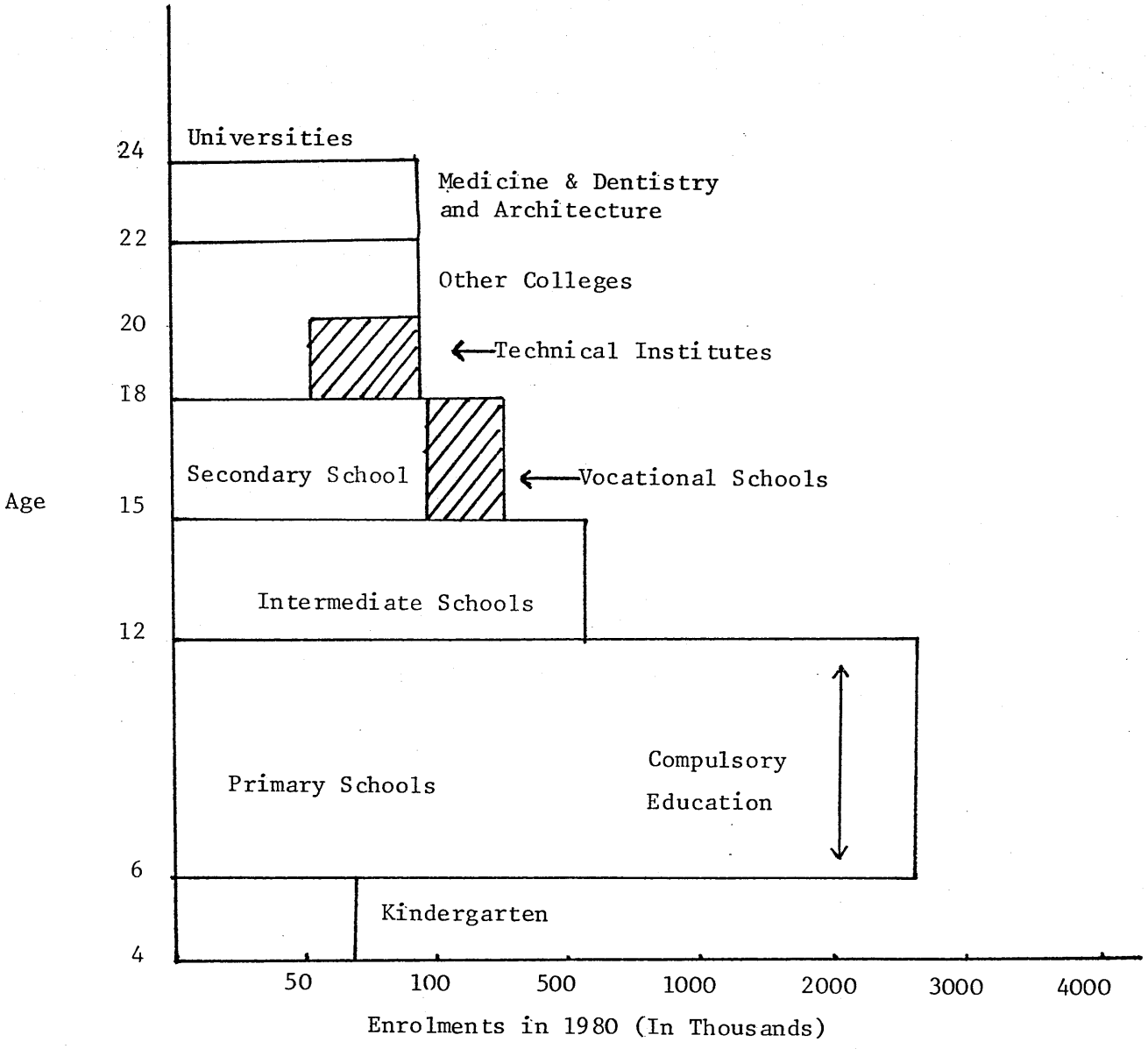
All of the above schools, kindergartens, elementary, intermediate and secondary, come under the jurisdiction of the Ministry of Education. Technical institutes, and universities come under the jurisdiction of the Ministry of Higher Education and Scientific Research. The present structure of the education system in Iraq is shown in Figure 3-1.

3.3 HIGHER EDUCATION

3.3.1 Evolution of Higher Education

Modern higher education in Iraq is of relatively recent origin. The College of Law was first opened by the Ottomans in 1908, but was closed during World War I. It was reopened in 1919 by the British authorities occupying Iraq, chiefly because of local pressure on one hand, and the

Figure 3-1: Structure of Educational System in Iraq 1980



Source: The percentages in this figure counted from Unesco Statistical Yearbook - 1982, (Unesco, Paris).

need for lawyers and trained government personnel on the other. All other professional and liberal arts colleges were founded after the formation of the national administration in 1921 (Nader, 1969, 339).

As in the case of higher educational institutions in other countries in the Arab region, higher educational institutions in Iraq did not evolve primarily in response to a general quest for knowledge. They were established instead to meet a particular need for specific specialized manpower. Thus "separate" colleges and institutes were founded in Iraq as the need in each respective field became pressing (Nader, 1969, 339). The Law of the University of Baghdad was not passed by parliament until 1956, which incorporated the already existing institutions of higher education into one university. Legally, the University of Baghdad has existed since 1958 (Nader, 1969, 175). When established, however, the university did not consider the immediate needs and prospective development of the country. Instead, it was a result of combining under one administration, the separate colleges which had been established at different times, by different governments to serve different purposes. This step, nevertheless, was a starting point for the systematic organization and development of higher education so badly needed by the country. To meet the evolving demands for higher education and the pressing need for professionally trained university graduates (teachers, physicians and engineers in particular) five colleges were opened in Mosul between 1959 and 1966 (The University of Mosul Catalogue, 1974, 11), and four colleges in Basrah in 1964, under the jurisdiction of the University of Baghdad. In 1967 these colleges became separate universities, the University of Mosul and the University of Basrah. Partly because of political reasons, the University of Salah Al-Din was established in 1969. This was followed

by the foundation of the University of Technology in 1975. In the sphere of higher technical education, the small scattered institutes, which were attached either to the Faculty of Technical Institutes in the University of Baghdad or to the Ministry of Education, consolidated under one independent administration named "The Foundation for Technical Institution" in 1972, under the jurisdiction of the Ministry of Higher Education and Scientific Research (Al-Rahim, 1978, 191).

Two factors contributed to the growth and rapid proliferation of these institutes. First, pressure on the universities because of their limited capacity, secondly, the need for technical workers. Employees in such work allow the highly qualified people, such as engineers, doctors and managers, more time to devote to their specialties (Al-Khafaish, 1977, 70). To fulfil this need, the government supported a large expansion in these institutes. Their number, hence, increased from only 6 institutes concentrated in Baghdad in 1970, to 14 institutes scattered all over the country in 1980, which came under four main areas of instruction: technology, agriculture, medical and administration. The number of students enrolled in technical institutes increased from less than 2,000 in 1970 to about 16,000 in 1980, and the percentage of graduates in these institutes compared with total graduates in higher education increased from 4% in 1970 to 37% in 1980 (Unesco Statistical Year Book, 1980).

Higher education in Iraq developed primarily as public institutions. Even though a few institutions began as private, eventually all higher education institutions became public. Al-Hikmah

University founded by American Jesuits in 1956, was made public and merged with the University of Baghdad in 1968. Al-Mustansiriyah University, Al-Sha'b University and Basrah College of Commerce were all established in 1963-64 as private institutions. In 1974, all private educational institutions became public, when the government abolished the tuition fees, making educational facilities at all levels of education into absolutely free public institutions (Al-Rahim, 1978, 137).

It has been stated that in spite of the accelerated evolution of higher education during the last twenty years, in regard to the number of institutions, students, teachers, graduates and expenditures, the product of such growth remains incompatible with the requirements of recent developments in the country. One of the most difficult problems the country faces today is the lack of trained people who are able to assume the burden of development responsibilities (Ministry of Higher Education, 1972, 19). This can be attributed chiefly to the educational policies which were not well established to cope with various problems of higher education.

One observer stated in 1976 that one of the serious problems of education in the Arab region is that "Universities have become crowded, staff and equipment are inadequate, and it is proving difficult to cope with social and economic changes and the surplus of graduates, particularly in literary specialization" (Al-Ghannam, 1976, 18). He emphasized that "in all cases, the major difficulty is that plans for the expansion of higher education have not yet been integrated in plans

for economic development or adjusted to present and future needs for highly skilled manpower. As a result, the economic benefits are not commensurate with the high expenditure devoted to this level of education" (Al-Ghannam, 1976, 31).

There have been efforts to implement new plans aiming at the reformation and modernization of higher education in Iraq. The system of higher education, however, remains plagued by serious deficiencies which have contributed to the retardation of achieving national development goals.

3.3.2 Structure and Objectives

One feature that characterizes higher education in Iraq is that institutions of higher education in the country are based on various Western models. For example at the University of Baghdad the College of Law was patterned after the French model. The Colleges of Medicine, Art and Science, on the other hand, followed the British style, and the College of Agriculture followed the American pattern. The colleges of Engineering and Education however are a mixture (German and British style for engineering colleges and American and British style for education colleges) (Al-Rahim, 1978, 139). This is probably due to the increasing number of staff who graduate from various European and American universities, as shown in Table 3-5.

Such a variety of experience could have represented an excellent opportunity to develop a healthier intellectual environment if the salient features of each pattern were integrated and adapted to local

Distribution of Staff at Baghdad University

According to Graduating States (1976)

Table 3-5 (Percentage)

College / Graduating State	Medicine	Engineering	Natural Sciences	Agriculture	Human Sciences	Education	Law	Total
U.K.	66	44	69	21	47	36	4	12
U.S.A.	14	12	18	67	14	38	-	19
Egypt	12	3	4	-	25	15	8	48
France	1	2	2	2	5	1	84	8
W.Germany	4	31	-	-	2	-	-	6
Other Western European Countries	2	6	5	5	3	5	4	4
Socialist Countries	1	2	2	5	4	5	-	3
Total	100	100	100	100	100	100	100	
Number of staff	155	146	192	52	286	84	62	977

Source: The University of Baghdad Catalogue, 1976, in Arabic (Baghdad University Press, Baghdad).

conditions. Instead, and may be because of the lack of communication and the absence of coordination, complexities and obstacles have dominated higher educational institutions throughout the Arab world as well as in Iraq. According to Szyliowicz:

> "The result of such diversity has not been to develop a unique model genuinely applicable to conditions in the region. First, curricula and texts remain based almost entirely on European or American models and seldom include any attempt to relate the material to contemporary national problems. Second: little agreement exists even within the same institution on such matters as degree requirements, curricula organization, or broader questions involving the goals of university training" (Szyliowicz, 1976, 319).

As a result, faculties which follow the American model tend to emphasize general education, and those based on European models show a much greater degree of specialization and concentration. This leads naturally to the third problem area. The courses are fixed and inflexible so that a student in one faculty finds in practically impossible to take courses in another, due to the differences in courses offered, teaching methods and examination regulations.

Thus, the structure of higher education in Iraq, and particularly at the University of Baghdad, has resulted in a large number of colleges and institutions of different levels, having practically no inter-relationship. Because of this, there were many unnecessary duplications, discrepancies and superfluous needs for teaching staff. (Szyliowicz, 1976, 319)

The authorities realized that such a complex state of confusion in the country's system of higher education does not correspond with the

real needs of national development. Therefore, in 1969, the government introduced one of the most decisive academic and administrative reforms of the system of higher education. In its Resolution No. 342 of 1969, The Revolutionary Command Council abolished all colleges and institutions of higher learning and organized a new structure of higher education with a strong intention to integrate higher education with national development (Al-Waga Bulletin, 1969). Currently, the institutions of higher education are as follows:- The University of Baghdad (1956), The University of Al-Mustansiryah (1964), The Universiy of Mosul and The University of Basrah (1967), The University of Sala Al-Din (1969), The Foundation for Technical Institutions (1972) and The University of Technology (1975). More details about these universities are shown in Table 3-6 and Figure 3-2.

Furthermore, to meet the crisis of higher education characterised by "structural confusion and the absence of plans", Law No. 132 of 1970 was promulgated to establish the Ministry of Higher Education and Scientific Research. (Al-Waga Bulletin, 1970) This step was intended primarily to implement the national policy regarding higher education, to administer educational missions and studies abroad and to conduct international educational and cultural relations. Thus the primary functions of The Ministry of Higher Education are:-

1. Establishing guidelines for long-term planning of higher education in accordance with national policy.
2. Assisting and encouraging higher studies and scientific research.

Higher Education Institutions in Iraq 1980.

Table 3-6

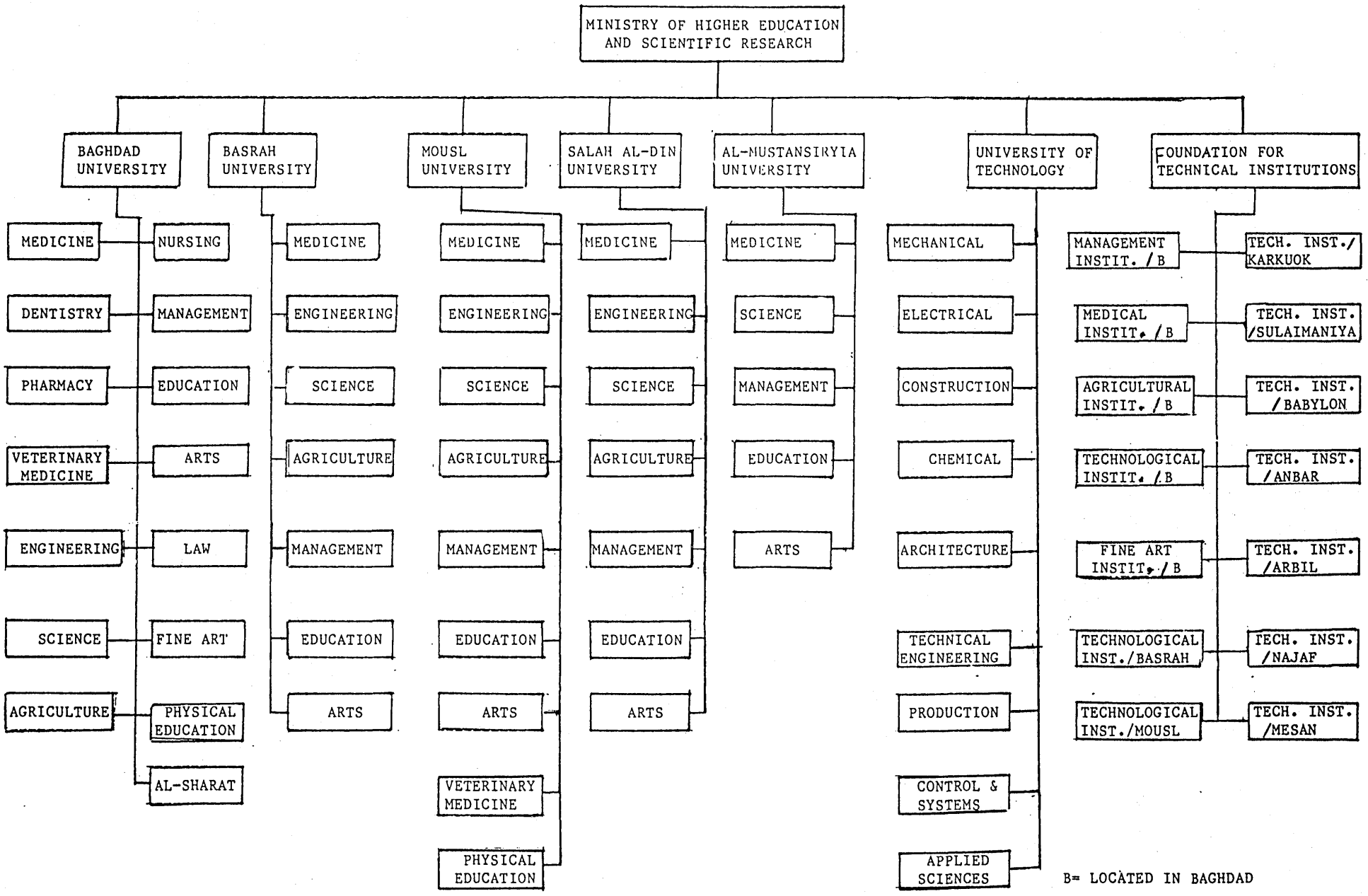
University or Institution	Establishment year	Location	Enrolment (No.)	Graduates (No.)	Staff (No.)	Budget(**)
Baghdad University	1956	Baghdad	35166	6100	1910	28.3
Basrah University	1967	Basrah	10640	1998	540	10.4
Mosul University	1967	Mosul	12786	2270	784	12.9
Salah Al-Din University	1969	Abil	6198	1066	339	7.3
Al-Mustansiriya University	1964	Baghdad	10551	1766	367	6.1
University of Technology	1975	Baghdad	8084	1443	195	6.5
Foundation of Technical Institutions(*)	1972		14987	8171	1545	20.1
Total			98412	22814	5680	91.7

Source: Ministry of Planning (1980), Annual Abstract of Statistics - 1980 (Central Statistical Organization, Baghdad) pp.240-244.

(*) The duration of the courses in these institutions is only two years, while in other universities it is between 4-6 years.

(**) In Iraqi Dinars

Figure 3-2: Structure of Higher Education in Iraq 1980.



3. Planning the training of academic staff, scientists, and specialists needed for higher education and research.
4. Strengthening cultural relations with other countries.
5. Organizing exchanges of experts, scientists and university staff.

For planning and coordinating higher education and scientific research the same law provided for the creation of "the Council of Higher Education and Scientific Research" to function as the supreme scientific body in Iraq. This council is headed by the President of the Republic. Additional members are the Minister of Higher Education as Vice President, the Minister of Education, Presidents of Universities, the president of the Foundation of Scientific Research, the president of the Foundation for Technical Institutions, the president of Teachers Union, representatives of the teaching staffs at universities (three members), representative of university students, the general secretary of the council, and a maximum of five scientists and specialists of different disciplines chosen by the president of the Republic (Al-Waya Bulletin, 1975).

The following are the main duties of the Council:

1. Proposing a supreme policy of education, culture, science and technology, considering its coordination and integration with the proposed social and economic programmes of the state.
2. Establishing a general policy to enable coordination and development of curricula, publications, theoretical and applied research in universities, higher institutions and centres of scietific research.

3. Enacting the necessary plans to develop the scientific standards of the faculty and discovering the appropriate means for its achievement.
4. Proposing general regulations for university education.
5. Recognizing Arab and foreign academic institutions, and providing the basis for equivalent scientific degrees and diplomas.
6. Specifying scientific and honorary degrees, titles and diplomas in the Republic of Iraq, and conditions for obtaining them.
7. Specifying the general requirements for admission into institutions of higher education.
8. Evaluating the conditions of scientific institutions, supervising their cultural and scientific activities, and providing the necessary recommendations and suggestions to achieve the stated objectives in the said law.
9. Proposing the establishment of new higher educational institutions and approving any change in the existing ones.
10. Auditing and providing its opinion on the Ministry's budget for the proposed projects.
11. Studying annual reports of the formal agencies and establishing a comprehensive annual report concerning scientific activities, their success and accomplishments, as well as their faults and difficulties. In addition, the council will present suggestions to the Ministry.

Although higher education in Iraq has developed tremendously during the last two decades, it remains characterized by significant deficiencies retarding the achievement of the national development goals, as noted by many observers. (See for example: Ahmed, 1977, Al-

Khafaish, 1977 and Al-Rahim, 1978).

To remedy the existing situation of higher education and to meet the expected requirements of various specializations for the national development plans, the Ministry of Higher Education has adopted a new strategy stressing the following objectives. (Ministry of Higher Education, 1976).

1. Intellectual transition and development of :

   (a) the philosophy and organization of higher educational institutions in relation to political, economic, social and cultural aspects of the state policy in its progressive movement towards the future.

   (b) adoption of the curricula to the need of society and its environment in order to enable scientific institutions to interact with the national development plan, while keeping abreast of scientific advancement.

2. Providing scientific and technical manpower in the most needed areas of specialization with an emphasis on their practical training.

3. Securing the required number of faculties, buildings, laboratories, textbooks and other relevant sources.

4. Improving the standards of scientific institutions and of their graduates through :

   (a) a smaller staff/student ratio

   (b) greater emphasis on applied studies

5. Creating a liaison between universities and other organizations throughout the country by allowing the teaching staff to work occasionally for non-academic organizations. This will enable them to become more aware of the nature of work and problems which students might face in their future career.

6. Creating a planning bureau within the Ministry of Higher Education which would specialize in scientific planning for all studies of higher education. The strategy also emphasizes the development of efficient systems of administration within the ministry, which would be able to cope with responsibilities of expansion.

As everyone knows, it is not a difficult task to issue any strategy, but the main difficulties remain in executing it. Hence the main question in the present situation of the higher education system in Iraq is "how successful such a strategy was in its attempt to improve the status of higher education in Iraq?" This question will remain an essential question to be answered, particularly if the relationship between higher education institutions and the labour market for highly qualified manpower is still not very well connected, which represents one of the main objectives of the above strategy and present study, as we shall discuss in the following chapters.

3.4: THE UNIVERSITY OF TECHNOLOGY (UOT)

Chapter one mentioned the fact that the sample for this study was drawn from the graduates of the University of Technology. Accordingly, this section intends to give a brief account of this university, its importance as an institution of higher education in Iraq, mainly the

foundation of UOT, its objectives, curricula and its usage of "two-stage systems in engineering education".

3.4.1 Foundation of UOT

In the last two decades, particularly after nationalization of the oil wealth in 1973, there has been a rapid increase in investments in all sectors of the national economy. The last five-year national plan (1976-1980) included a significant and rapid expansion in the industrial structure, both in establishing new industries and expanding many of the existing ones. For example the leve of investment in 1976 was increased by 58% from the previous year.

Meanwhile, less than half the engineers required by the rapidly expanding economy of eleven million people (in 1975), have graduated from the country's four schools of engineering - Baghdad, Mousul, Basrah and Salah Al-Din. The Ministry of Planning estimated the need for new graduates in 1976 to be in excess of 4000. Only 1730 were able to graduate from the existing schools of engineering.

However, the Ministry of Higher Education, responding to strong pressure from many economic sectors, especially the industrial sector, noted that the skills of engineering graduates were inappropriate for the development needs of Iraq. The theoretical and research emphasis of existing engineering programmes needed to be refocussed towards applied and design engineering. In response to those problems, the Ministry of Higher Education made an attempt to increase both the output of graduates and redirect the curriculum at the four engineering schools.

The Ministry then established a new university to be a major channel for the supply of the engineers required and to be phased with the industrial changes. The existing College of Technology attached to the University of Baghdad was separated from its mother university and became the nucleus for the new university, with a small number of students and faculties from the University of Baghdad. The University of Technology began operating in 1975 and its broad objectives were defined as follows (Table 3-7):

1. Graduating engineers, with special emphasis on engineering applications, and in response to the need of the national development plans.
2. Graduating technical teachers according to the need of the national development plans.
3. Conducting applied research and providing engineering consultancy to the industries.
4. To give special attention to postgraduate studies and the very specialized disciplines, and develop them according to the national needs.
5. Creating new ways and modes for engineering education training and life-long education in phase with the technological developments and the country's needs. (Al-Waga Bulletin, 1975).

Accordingly, one of the fundamental purposes of the UOT is meeting Iraqi manpower needs and the creation of UOT appears to be the result of political forces. Rowley argues that the creation of the Technical Universities were the result of educational politics (Rowley, 1969). The evidence for creating UOT and all Iraqi universities suggested that this was not true. After making an unsuccessful attempt to redirect

Principal Activities of the University of Technology

and Its Relationship with the Objectives.

Table 3-7

Pre-set Objective	Related Activities	Unit In Charge
1. Graduating engineers	- B.Sc. programmes - Inside and outside training programmes	- Academic Departments - Training and workshop office
2. Graduating technical teachers	- B.Sc. programmes	- Technical education department
3. Applied Research and Consultancy	- Suggested applied-research - Educational and engineering consultancy	- Permanent Committee - Bureau
4. Professional development	- Continuing education programme - Faculty development politics - Seminars and conferences	- Continuing Education centre - Senate - Academic departments continuing education centre

Source: Al-Naimi, T., Al-Nassri, and Hamame, Y.T. (1980) UOT and Its Role in the Implementation of the National Development Plans, in Arabic, Al-Senia Journal, Vol. 2, (Ministry of Industry, Baghdad), pp.12-20.

both the number and type of graduates at the various engineering schools, the Ministry of Higher Education created the UOT in the context of a set of governmental forces which were themselves the result of expressed needs for Iraqi economic and industrial development.

Panitchpaledi suggests that even when developing countries' governments attempt to use the university as a broad-based instrument for social change it often fails (Panitchpaledi, 1974). According to Panitchpaledi, "it is difficult to strike a balance between the social, educational and manpower training purposes of a university, because most developing countries are not politically sophisticated enough to resolve a variety of issues in the educational system". It was implicitly assumed that UOT would adopt, as one of it purposes, to develop the relationship between itself and the Iraqi manpower needs, in addition to satisfying the needs, desires and hopes of the individual students.

Although only ten years have elapsed since the birth of the UOT, its achievements appear to be in line with the objectives. In 1977 the university provided 29% of the country's need for new engineers and technical teachers. This figure was raised to 38% in 1979, and to approximately 50% in 1980. (Al-Naimi, 1980, 12). In addition to these quantitative achievements, an increase has also occurred in the number of specializations offered. For example, in 1975 there were only three academic departments, namely Mechanical, Electrical, and Construction (Civil) Engineering, while in 1980 there were nine major disciplines including Control and Systems, Production, Chemical, Technical Teacher Training, Architecture and Applied Sciences departments. Most departments also have elective or stream specializations, such as power

engineering and electronics.

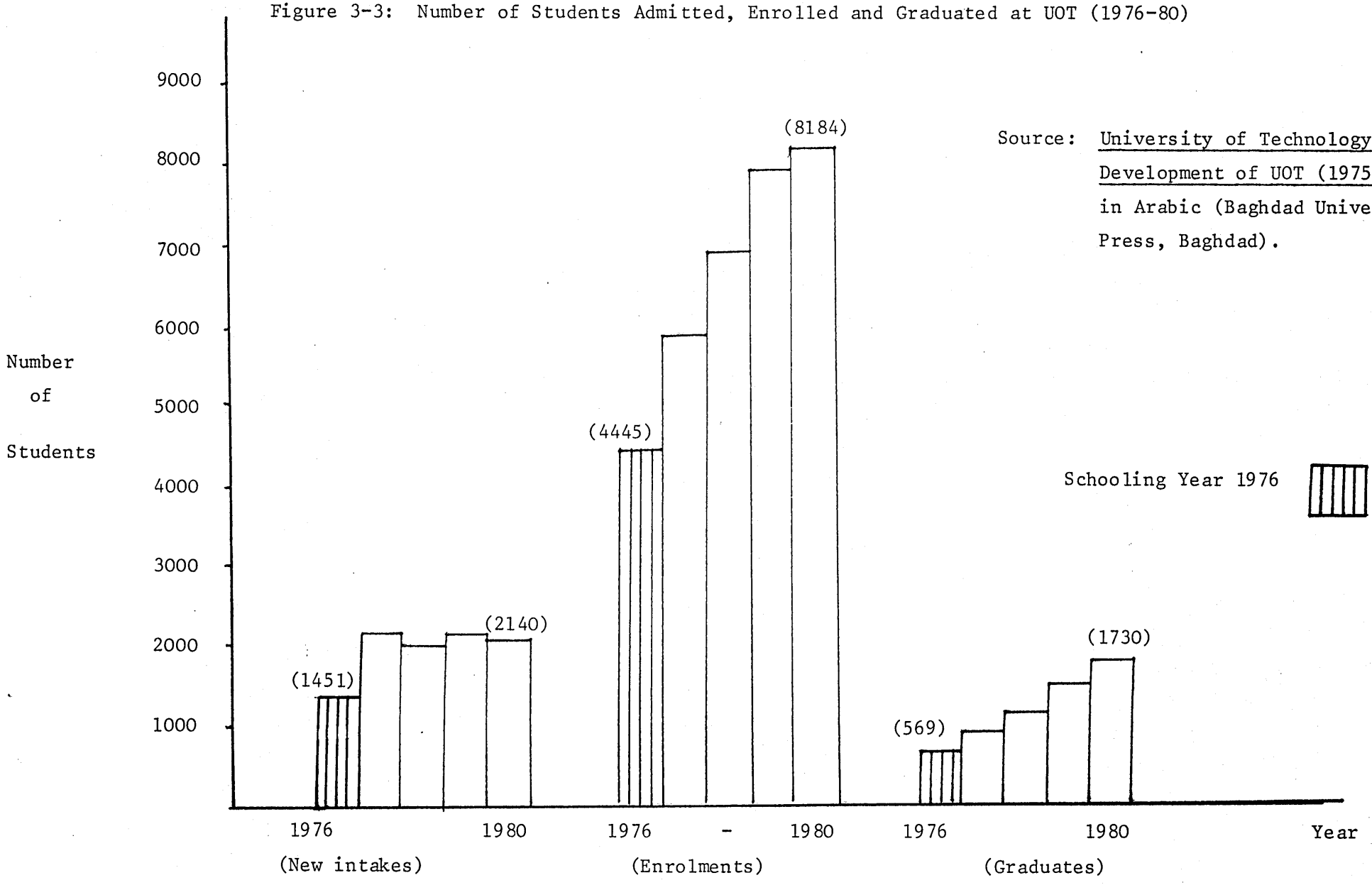
With these developments during 1976-80, the number of new student intakes, enrolments, and graduates increased by 47%, 84% and 204% respectively, as indicated in Figure 3-3. At the same time the number of academic staff, technicians, administrators, and workers were increased by 56%, 86%, 124% and 60% respectively. (Figure 3-4).

3.4.2 The UOT Two-stage System in Engineering Education

The UOT have a unique system (among other four engineering schools in Iraq) in engineering education, which is dividing the B.Sc. programme into two stages. According to this system, the first-two years of curriculum (stage one) are oriented towards fundamental topics and gear the students towards the operation and maintenance side of engineering work. At the end of stage one a technical diploma is awarded entitling him/her to become a qualified technician (if he or she desires). After completing a further concentrated short course (approximately six months) in a more specific field (e.g. electrical installation, welding, and construction form work), the third and fourth years of the curriculum (stage two) are geared towards the design and analysis side. Table 3-8 summarizes the fundamental structure of the curriculum for the two-stage system currently used.

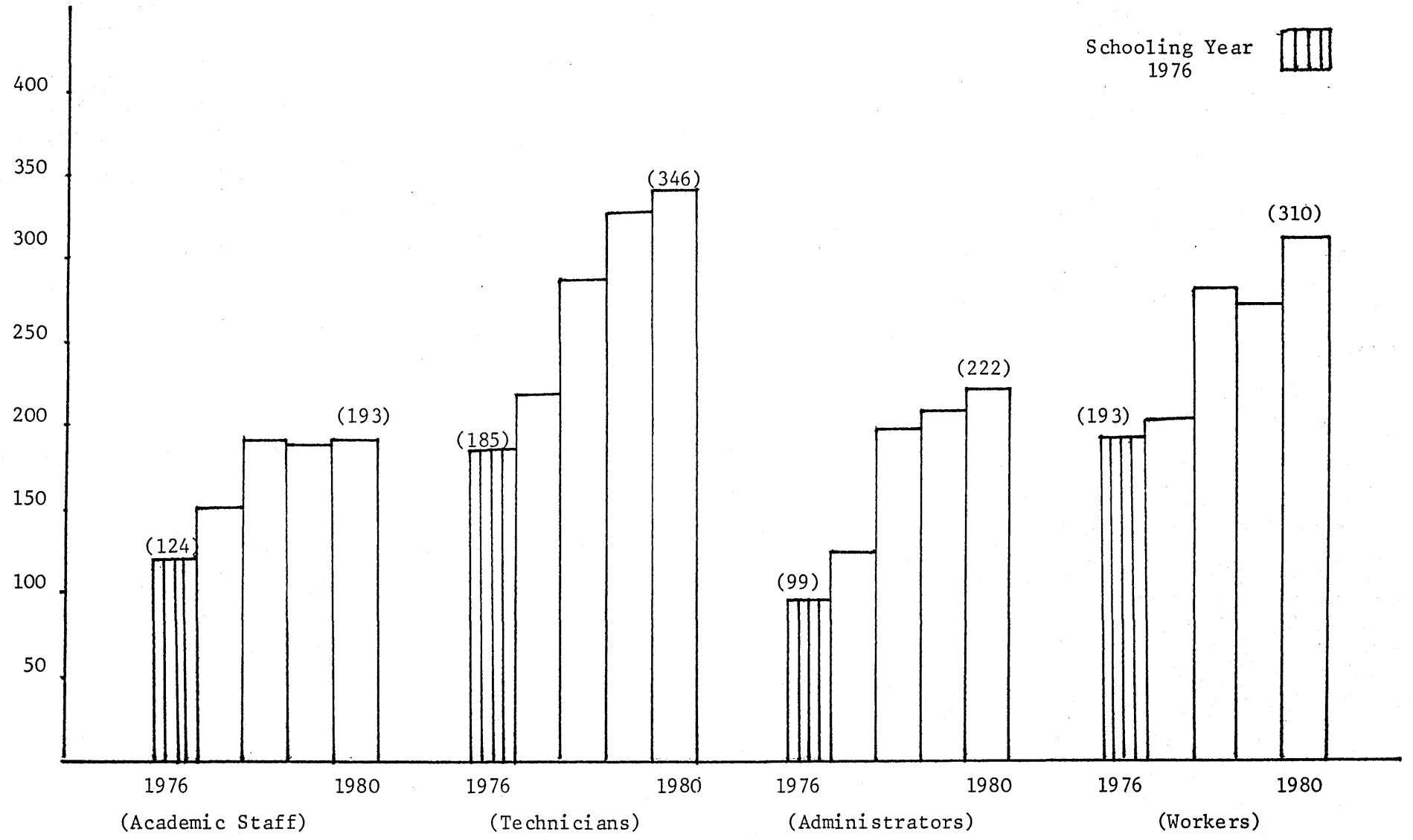
The two-stage system is designed to give the students a chance to explore further his individual ability and skill. After a two-year study period, there are many students who find themselves inclined towards the technical function rather than to the engineering function in the industrial activities (Al-Naimi, 1978). More important, after two or three years of studies, many students find themselves unable to

Figure 3-3: Number of Students Admitted, Enrolled and Graduated at UOT (1976-80)



Source: University of Technology (1982 Development of UOT (1975-81) in Arabic (Baghdad University Press, Baghdad).

Figure 3-4: Number of Working People at UOT (1976-1980)



Source: University of Technology (1982), Development of UOT (1975-81), in Arabic, (Baghdad University Press, Baghdad).

The B.Sc. Curricula Structure at UOT.

Table 3-8 (Percentage of total hours)

Specification	Stage One		Stage Two	
	Minimum	Maximum	Minimum	Maximum
(*) 1. Subject:				
Fundamentals	10	25	5	15
Humanities	10	15	10	15
Engineering and specialization	55	80	65	90
(**) 2. Type:				
Theoretical	30	50	40	50
Tutorial	10	20	10	20
Practical and application	30	60	30	50

(*) Compulsory industrial training of 3 months in stage 1.

(**) Number of theoretical subjects in any term 5-7 inclusive.

Source: Al-Naimi, T., et al (1978), "The two-stage system in undergraduate education" Arab Universities Bulletin, in Arabic, Cario.

continue studying due to social circumstances, illness, financial or academic inability. The two-stage system reduces the national economic loss due to many of those who leave, as they will still be vital and useful members of industry working as technicians. The system gives the student the opportunity to enrol for stage two after two or three years of approved, supervised and organized practice. It is also hoped that many good students will willingly leave the university after finishing stage one and become part of the technical manpower urgently needed for the next decade or so. Various incentives have been proposed by the university in order to adjust the number of students voluntarily leaving or entering the system, and in response to the engineer/technician ratio needed in the implementation of the national development plan.

The advantages of a two-stage system can be summarized as follows (Al-Naimi, 1981, 4).

1. Flexibility in the UOT education system and the realization of the interaction with local industry through multichannel training schemes. (Summer training, working period between two stages, research projects at the end of stage two).
2. To contribute in providing technicians for various engineering sectors which is badly needed in the Iraqi society. (*)
3. To provide graduate engineers and technologists with a high degree of awareness of the national needs and problems.
4. To implement the concept of dynamic curriculum development.
5. The practical maturity of the students due to this system of education will enable them to acquire advanced technology.

(*) The researcher will come back to give more details about this point later in the study.

It is evident that each stage has its own characteristics and is made up of an integrated programme. The emphasis, however, in the first stage, is on developing the practical capabilities. These are reflected in the laboratory, workshop and industrial training. The second stage emphasizes the quality aspects of engineering with special attention given to project work and independent activities.

3.4.3 The UOT Curriculum

The curriculum in any university represents a vital tool in achieving its goals. However, in the last two decades or so, many engineering schools have had second thoughts about their conventional curricula.

These reviews often resulted in the introduction of non-technical subjects. This was by no means accidental, but an inevitable reaction to changes in society and the new role expected of the engineer. Admittedly, there are diverse arguments on what subjects should be introduced or replaced. In developing countries, these trends towards curriculum changes become urgent, and indeed, vital to social, political and economic developments. It is of interest in this chapter to examine the University of Technology's policy and curriculum changes as a reaction to the social, political and economic developments.

In comparing the 1975 B.Sc. curricula with that of 1980, the following common changes (Table 3-9) for all departments are observed. (Al-Naimi, 1980, p.15).

(a) An increase in the non-technical subjects, e.g. industrial management, psychology, and cultural education, from an average of 4.6% to 11% of the total contact hours.

(b) An increase in the practical and applied hours from 33% to 44%. In addition to this, each student must complete satisfactorily three months of industrial training.

Changes in the percentage and distribution of time in the B.Sc. Engineering Course of the UOT between (1975-1980)

Table 3-9 (Percentage)

	Subject	1975	1980
1.	Humanities (non-technical subjects)	4.6	11.0
2.	Practical and application	33.0	44.0
3.	Technical (theory)	62.4	45.0
	Total	100.0	100.0

The UOT's strategic policy in curriculum development seems to have been crystallized into the following points:

1. Importance is given to the humanities and their integration with technical subjects.
2. Emphasis is given to the practical and application aspects of the curriculum.

3. Practical training is considered vital to engineering education.
4. Modern techniques in the teaching and learning process are encouraged and emphasized.

Undoubtedly, the above changes must have considerable end results in producing competent engineers who are capable of contributing to the country's social, political and economic goals, and that is what we are going to examine later in this study.

3.5 SUMMARY

Up to the sixties, educational achievements were not only very limited in the number of students enrolled, but also were of low standards. While educational policies emphasized a traditional education, vocational, technical and higher education were greatly neglected.

The turning point in the expansion of educational opportunities came with the 1968 revolution. The leadership's desires, and the increase in government's revenues were both concentrated to remedy the existing situation and to meet the increasing demand for education, which have had their positive impact on national development during the 1970s. Since then, the institution of higher education have witnessed the most rapid rate of growth. Trends towards the needed area of specialization have been noted recently when the UOT was established in 1975, and the great expansion in technical institutions which has taken place since 1972.

Nevertheless, the education system in general and higher education in particular are still suffering from problems, such as the pressures for more places in higher education shortage of staff and the graduates' standard.....etc.

In the next chapter, the social demand for higher education will be investigated in order to throw some light on the main reasons for this demand, which could help in formulating the guidelines for any long-term plan urgently needed for the higher education system at the national level.

CHAPTER 4

THE DEMAND FOR HIGHER EDUCATION

4.1 INTRODUCTION

Throughout the world today higher education is being remoulded by the action of powerful forces whih are impinging on the whole of modern life and radically changing its patterns as well as its urges. Among these forces mentioned in developing countries, may be made up of the population growth, the expansion in primary and secondary education, the spread of industrialization in most of those countires, the "revolution of rising aspirations" leading to greater democratization in many aspects of society, and especially in the right of education. "Most of these changes are inevitable results of political independence in most of the developing countries" which have a large effect on educational policies for those countries. (Frank, 1973, 9).

The demand for higher education has increased. Though the facilities for higher education have also been growing, their rate of growth has in most developing countries, been much slower than that of demand, and the disproportion is increasing with the years. This creates more problems for higher education institutions as well as governments and other groups. The most important are the imbalance between the graduates from higher education institutions and the economy's needs, and the high demand for the places at higher education institutions.

The imbalance between higher educational output and the economy's needs reflects that the higher education system has not been moderately adapted to the needs of the economy (manpower approach), and the demand of the individual and society (social demand). In the central planning economy, such as in Iraq, there are three main environmental forces, the

first is customer demand, which refers to the pressure of students to get into the universities and the curricula which they want when they get in (this will be the main subject of the present chapter), the second is manpower needs, which means to fit graduates into employment. The third is cost-benefit analysis which can be suggested as being the most efficient way to conduct the higher education system. (Ashby, 1973, 16).

In Iraq there is a general tendency that the supply of places should respond only to the future educational needs of the economy and these needs should be the main determinant of the current supply of places at higher education. This view was demonstrated in the political report adopted by the "Eighth Regional Congress of Arab Ba'th Socialist Party":

> "Higher education institutions must be reshaped to meet the needs of the revolutionary transformations led by the party. In particular, we must concentrate urgently on the different levels and branches of science and technology which will give us the experts needed for the country's growth and for its resolute entry to the age of technical and economic development". (The Revolution in Iraq, 1979, 179).

Studies by economists on the role of higher education in the national development have raised some important questions. One of them is - Does the state exist for the individual or the individual for the state? Regarding the development of human potential capacities, this question implies that there is a choice between educating the individual for his own sake and educating him for the sake of the nation. Harbison and Myers claimed that "the direction along which an education system develops depends on the ideology which underlies the society whether or not the society is economically advanced" (Harbison, 1964).

In advanced economies, for instance in post-war Japan, and also in the United States, the development of the higher education system is directed by the general principle that education should be primarily for the sake of the individual. This implies that knowledge should be sought for its own sake and without bearing the interest of the nation in mind. It is believed, according to Harbison and Myers, that men and women so liberally educated participate more effectively in an advanced economy. Hence the higher education system is constantly adjusting to social and individual demands.

In contrast, in the U.S.S.R. Harbison and Myers pointed out that education and national purpose are inseparable. The soviet system is therefore geared to the production of highly specialized technical and scientific manpower needed for an industrialized society. (Harbison, 1956). In addition, the Soviet education system seeks to mould the character of the individual through courses that propogate the Soviet political ideology. Thus the system aims not to serve the individual, but rather it is planned to enable him to perform functional tasks in the Soviet society.

Further reviews of literature on whether education should be for the sake of the individual or of the state reveals that in the underdeveloped countries the interest of the nation counts much more than that of the individual. With specific reference to the role of universities in Iraq and whether higher education systems should seek to protect the interest of the individual or that of the nation, the proceedings of a series of conferences provided the answer. For instance at the first conference held in Beurit in 1971, concerning the

planning of higher education in Iraq during the seventies, the main functions of Iraqi universities were cited as :

> "Iraqi universities must be closely involved in the general economic, social and rural development of the Iraqi society....far from becoming ivory towers detached from society in which they are situated. The Iraqi universities must be committed to active participation in social transformation, economic modernization and the training of the total human resources of the nation." (Ministry of Higher Education, 1977).

The educational policies for the Iraqi government since 1968, have remained in this direction when they concentrated on the role of higher education systems to protect the interest of the nation. However, Harbison and Myers warned that in planning the human resource development of any nation, man has some obligation to help build the kind of economy which can provide decent living standards and protect basic freedoms. By the same token, the state must make some concessions to the interest of the individual in order to survive. In other words, there must be some compromise or blending of both the interest of the state and that of the individual for a happy existence. (Harbison, 1964).

The author is of the opinion that, in spite of the importance of the educational needs of the economy, it will be necessary to keep the balance between the manpower needs and the individual demand because we have to keep in mind that higher education is not a factory where the input (students) can be directed to a final product (graduates) to satisfy the needs of economy, because students are human beings who have other kinds of motivations which should be satisfied in order to prepare productive skilled manpower. The real situation is that educational providers at higher education level are under tremendous pressure

because they have to think, firstly of economic needs, and secondly of the demand of society for higher education.

Thus in this chapter we will review the individual demand for higher education to trace its trends and the main reasons influencing the social demand for higher education in Iraq during the 1970s. We will use the data collected throughout the interviews of our sample in order to study this problem in depth. Hence, the rest of this chapter will deal firstly with the main reasons for the social (individual) demand for higher education, with special emphasis on the positive and the negative aspects of this demand, secondly with the access to higher education and the factors which are playing a major role in choosing specific fields of study at higher education, and finally, the social background of UOT graduates will be analysed in terms of the educational levels and the occupations of the parents, and the provinces they originated from, in order to find if there is any significant relation between these social factors and the distribution of secondary school leavers among the main fields of study at UOT.

The above issues still represent the main problems facing the higher education system in Iraq, and we believe that it is very important to draw some guidelines for solving such problems throughout the present study.

4.2 REASONS FOR INCREASING DEMAND FOR HIGHER EDUCATION

The debate about the demand for education in general and higher education in particular, has been increasing during the last three decades in developing countries, since most of these countries achieved

their political independence and look forward to development. In the first stage, all the emphasis had been on the lack of physical capital, but later most of them, especially the oil-rich countries, discovered that physical capital was not enough, and without the human factor, all efforts towards development could fail. So the educational explosion started in those countries with the beginning of the sixties; twenty years later, two main consequences are being recognized. The first is the endless escalation of costs as rising enrolment ratios. In many countries education was taking 10-15% of government expenditure at the beginning of the sixties, and 20-25% by the end of the decade. According to Unesco, public expenditure on education equalled 2.4% of GNP in the average developing countries in 1960 and 3.4% in 1970. (Unesco Statistical Yearbook, 1973, Table 2.6). The second, which is more important, is the problem of unemployed educated people; those who have got what used to be considered valid visas into the modern sector but have not found a suitable niche to settle in.

Before discussing the positive and negative aspects of the increasing demand for higher education, we would like to explain in some detail, the main reasons influencing the increasing demand for higher education in Iraq. According to the data available for this research, the demand for higher education places in Iraq is due to a series of reasons which can be explained as follows.

1. Demographic factors which represent a tremendous increase in people coming up to higher education. As a result of the high birth rate - approximately 3.3% since 1950, the population aged 19-23 increased from 685,000 in 1970 to 1,014,000 in 1980. This represents growth

of 48% during the perioid. (For details see Section 2-3). This high growth of population put great pressure on higher education institutions, as well as on secondary schools, to expand their places in order to meet the individual demand for education at both levels.

2. The number of qualified school leavers, in particular those coming from general secondary schools, has been perhaps the most important factor in determining rates of growth in higher education. It is immediately apparent from Table 4-1 that secondary school leavers grew more rapidly during the 1970s, than the number of students admitted to higher education institutions, in spite of the expansion of higher education places. It is clear that during the 1970s, for which period detailed statistics exist, the number of admissions remained well under 72% of the number of graduates from secondary schools, and the gap between them began to widen. A recent study suggested that this percentage decreased to about 50% during the period 1981-85, as shown in Figure 4-1 (Hamame & Al-Rahim, 1981, 12).

3. The number of female students admitted to higher education institutions has increased at a distinctly higher rate than that of male students during the 1970s (173% and 122% respectively). Since the two genders are subject to similar variations (at least with regard to the age group relative to higher education), the rate of enrolment for females has therefore increased more than that for males. However, we are still far from achieving equality of educational opportunity between the genders at this level. In 1980 women accounted for just under one-third of the total students in

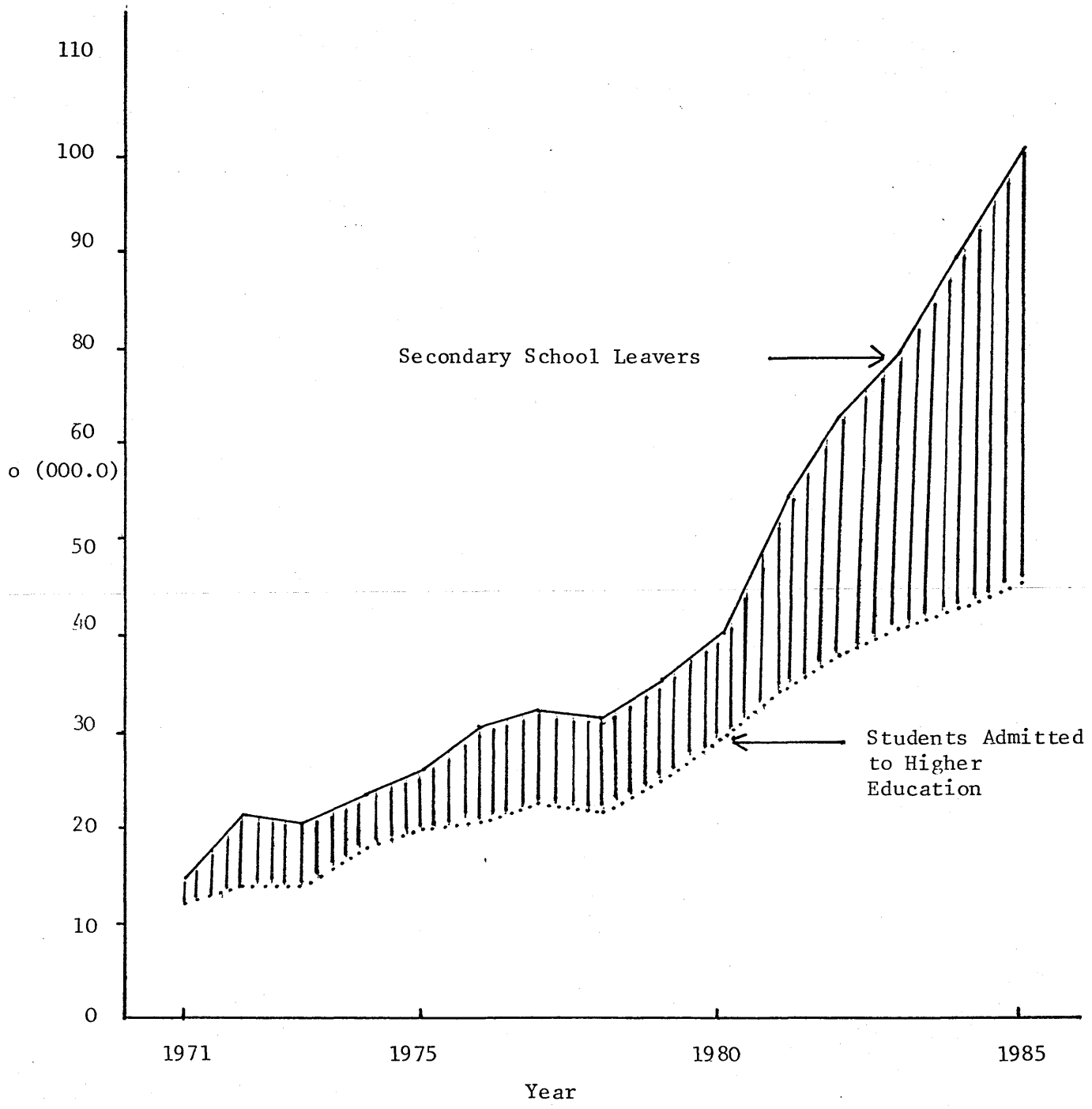
Growth of Secondary School Leavers and Students Admitted to Higher Education (1970-1980).

Table 4-1

Year	Secondary school leavers (1) (000.0)	Students admitted to H.E. (2) (000.0)	Percentage of students admitted (=2-1) (%)	Growth (%)	
				Secondary school leavers	Students admitted to H.E.
1970-71	14.6	11.9	82	100	100
1971-72	21.6	14.1	65	148	118
1972-73	20.4	14.2	70	140	119
1973-74	23.0	17.6	77	158	148
1974-75	26.3	19.9	76	180	167
1975-76	30.1	20.6	68	206	173
1976-77	32.1	22.8	71	220	192
1977-78	31.7	22.4	71	217	188
1978-79	34.9	24.8	71	240	208
1979-80	40.3	29.2	72	276	245
Total	275.0	197.5	72		

Source: Ministry of Planning (1980) Annual Abstracts of Statistics - 1980, (Central Statistical Organization, Baghdad).

Figure 4-1: Growth of Secondary School Leavers and Students Admitted to Higher Education in Iraq 1970-85*



* Figures for 1981-85 are estimations and quoted from: Hamame, Y.T. and Al-Rahim, S., (1981), Projections for Admission Plan at Higher Education Institutions of 1981-85, Unpublished Report, in Arabic, (Ministry of Higher Education, Planning Office, Baghdad).

higher education in Iraq. This is partly due to the number of females graduated from secondary schools which was about the same proportion in 1980. It is interesting to note that in spite of the general admitted rate relative to the secondary schools graduates decreased for both the total and males; during the 1970s the admitted rate for females increased over the same period, as shown in Table 4-2.

4. Another main reason for the pressure on higher education is the actual academic structure for secondary schools which does not provide students with a suitable skill with which to enter the labour market. Hence the only options available to secondary school leavers are either to apply for a place in higher education institutions in Iraq or abroad, or enter the labour market, and accept a job which can be held by less educated people. To avoid this situation they reluctantly accept any place in higher education rather than such a job.

5. The great increase in living standards of the people of Iraq since 1973, when the GDP increased by more than five-fold during the 1970s alone (Section 2-5), which brings with it a general expectation of the advantages to be gained from higher education.

6. The feeling that higher education is the peak in obtaining education. Many people consider that level of education is the final stage of education process.

7. There is a factor of prestigeous and high social status which influences people to look for higher education, because most of the members of the high class families go on to higher education, as we shall see later in this chapter.

Admittance Rate at Higher Education in Relative to Secondary School Leavers in 1970 and 1980.

Table 4-2

Sex	1970	1980
A. Secondary graduates (thousand)		
Male	10.3	27.0
Female	4.3	13.3
Total	14.6	40.3
B. Students admitted to higher education (thousand)		
Male	9.5	20.3
Female	2.4	8.9
Total	11.9	29.2
C. Admittance rate (%)		
Male	92	75
Female	55	67
Total	82	72

Sources: (a) Unesco Statistical Yearbook, 1972, (Paris, Unesco)

(b) Unesco Statistical Yearbook, 1983, (Paris, Unesco)

8. The total demand for places in higher education is likely to be influenced by the evolution of the labour market, as a result of the expansion on all economic sectors in Iraq since 1973, when the government investment alone increased by more than six-fold between 1973 and 1979.

As a result of these factors there was a tremendous increase in places at higher education institutions. The total enrolment as a percentage of the population aged 19-23, increased from 2.1% in 1960 to 5.9% in 1970 and then to 9.7% in 1980. Total enrolment in higher education tripled between 1960-70, and more than doubled again between 1970-80. The opportunities for girls have also been increasing. Betweeen 1960-70 they increased more than four-fold, and between 1970-80 tripled, as shown in Table 4-3. For more details about the number of new intakes, enrolment and graduates at all institutions of higher education in Iraq during the 1970s, see Figure 4-2.

Thus, the economic expansion and those factors already mentioned, in the long run will propbably contribute to putting heavy pressures on higher education institutions to accept more and more students. The balance of the demand for places in higher educaton in the future is probably dependent on the government policy, subject to economic expansion, and the new conditions created by the government.

However, the high pressure on higher education institutions to accept more students could lead to what is called in literature the "educational inflation". Murray Milner introduced this idea in 1972, which referred to the spiraling educational qualifications required for

Growth of Enrolments in the Universities, Colleges and Technical Institutions 1960-80.

Table 4-3 (Thousands)

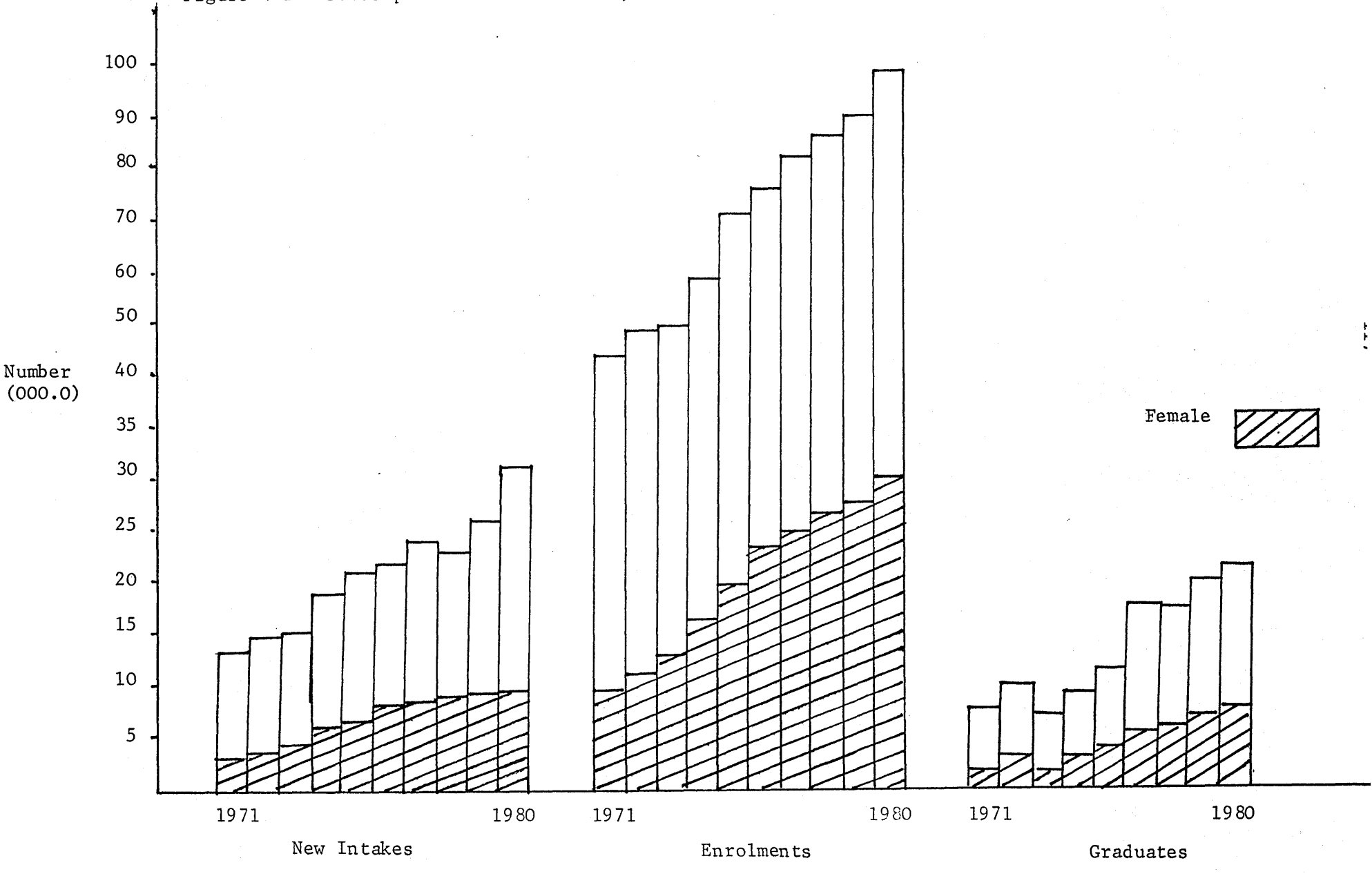
Year	Male	Female	Total	Female (%)
1960	8.6	2.5	11.1	23
1965	15.2	6.1	21.3	29
1970	31.8	11.6	43.4	27
1975	51.1	19.2	70.3	27
1980	70.8	31.7	102.5	31

Date for this table quioted from:

1. Ministry of Planning (1970), Progress of Education in Iraq 1960-70, (Central Statistical Organization, Baghdad), p65.

2. Ministry of Planning (1980), Annual Abstract of Statistics 1980, (Central Statistical Organization, Baghdad).

Figure 4-2: Development of New-intakes, Enrolments and Graduates at Higher Education.



particular jobs (Miller, 1972, 42). For instance, a job done in the past by secondary school graduates may now require a university education. In another book Ronald Dore introduces the concept of diploma disease which relates directly to Milner's qualification escalation. By diploma disease, Dore specifically means "the dependence of individual life-chances on certificates of school achievement" (Dore, 1976, 12). A major hypothesis of Dore's book is that "the later the point in the world history that a country begins its deliberate modernization process, the more definitely the disease takes hold" (Dore, 1976). Dore discusses in detail the educational histories of Britain, Japan, Sri Lanka and Kenya to support his argument empirically. Another related new concept is "over-education" introduced by the Harvard economist, Richard Freeman. Freeman analyses in detail the American labour market's capacity to absorb higher educated manpower and tries to explain the declining economic returns received by more recent university graduates in the U.S. (Freeman, 1976).

Despite the criticisms of degreeism and over-education implied by Dore and Freeeman, possible benefits that may derive from an emphasis on degree and certificates should not be ignored. The many advantages of the degreeism in developing countries are :

1. The education sector in developing countries accounts for a large proportion of total employment.
2. Employers seek information about potential employees and often use degrees as a proxy for a wide range of information about an individual, such as his motivation, language abilities and social skills. To obtain such information through other means would be extremely costly.

3. Another possible benefit of degreeism relates to the issue of income equality. According to classical economic theory rapid increases in the supply of college graduates should lead to a relative decline in rewards to such individuals (Fry, 1981, 517). Thus, if such market mechanisms actually work, an emphasis on degreeism could lead to declining income disparities between university and non-university graduates.
4. A fourth aspect of the degreeism dilemma concerns dependency. Third World intellectuals stress the need for developing countries to reduce their dependency on the industrialized nations. Given the importance of degreeism throughout much of the world, countries aspiring to intellectual independence must have a large cadre of advanced degree holders. Degree oriented Asian countries such as Japan, India and the Philippines, have shown a considerable degree of intellectual independence (Fry, 1981, 517).

Having looked at a number of benefits from degreeism, it is useful to turn to some negative aspects. A first point relates to the over-education issue raised by Freeman. The doctoral degree, for example, is basically a research degree, involving training for a career as a researcher. But in many Third World countries it has become a prestige degree implying high intellectual attainment. (Freeman, 1976). In Iraq, many bright individuals aspire to administrative careers with no serious interest in researh work related to their doctorates. As a result, there are many individuals with doctorates holding executive positions, for which M.B.A. or even B.A. degrees would undoubtedly suffice. According to Fry, this type of over-education is extremely costly in three respects: (1) doctoral work normally requires 4-7

years of study beyond the first university degree. Thus highly significant opportunity costs are involved. Bright and capable individuals are, thus, absent from the labour market at the time when they are potentially active and creative; (2) doctoral training, particularly in the U.S. or Europe, involves high foreign exchange costs. (Fry, 1982, 521). For example, the studying expenditures for Ph.D. students cost the Iraqi Government $ 60,000 on average until he/she gets the degree, plus equal amount as an opportunity cost usually paid to a foreign expert during the study period. Normally, for Third World countries, foreign exchange is a scarce resource which should be carefully conserved; (3) doctoral training does not necessarily improve an individual's capacity as an administrator or policymaker. In fact, doctoral training may even create distance between administrator and his subordinates.

A second negative aspect of over-education is its high financial costs. In Iraq, for example, university education in terms of cost per student, is over 17 times more expensive than primary schooling and more than 12 times more expensive than academic secondary education. Also, higher education absorbs roughly 27% of the total education budget in 1978, while the enrolments form only 2.6% of the total enrolled students at all educational levels. (Unesco Statistical Yearbook, 1982). The same basic pattern prevails in many other developing countries.

Another negative aspect of degreeism relates to its impact of fundamental values towards jobs. Degree holders in most developing countries have a tendency to prefer becoming "knights in air-conditioned offices". The following comment on the Indonesian educational system

illustrated how one of the Third World countries faced this problem:

> "The present educational system in Indonesia is mostly a residue from the colonial era, with its emphasis on producing graduates who prefer white-collar jobs together with their corresponding social status instead of jobs using skills." (Fry, 1981, 525).

Another major drawback to degreeism, according to Bowles, relates to the fundamental issue of competency. Traditionally, top positions went to individuals based on who they were. Now such positions tend to go to those holding high degrees, even if they are not the correct degrees. (Bowles, 1972, 219). Thus, degrees tend to direct attention away from true competency, which should be the real concern of educators and society as a whole. In fact, if an individual is able to attain competency on his own with minimal degrees or formal schooling, he should be lauded, since he did not utilize scarce public resources or funds. In other words, his learning has been highly efficient in a cost-effectiveness sense.

Having discussed both the positive and negative aspects of degreeism the author is not against university education, he is only arguing that it should be reserved for those aspiring and able to conduct such study with high standards and with considerable concern about the national needs for specific fields of studies, in order to secure both, the effective utilization of public funds, and the achievement of development objectives. That is the main function of the higher education planners in developing countries. To what extent did the planners of the higher education system in Iraq succeed in solving such problems in the last 20 years? We are going to discuss this later in the study.

4.3 ACCESS TO HIGHER EDUCATION

To enter university, the students have to pass the baccalaureate examination at the end of secondary level. The students are distributed for studies according to their specializations and marks in the baccalaureate examination. The "Central Bureau for Admission" in the Ministry of Higher Education is the central authoirty respoinsible for accepting the students for university study and distributing them to appropriate faculties. Students with the highest marks in the science stream are accepted to study in medical faculties followed by engineering, science, agriculture, management, statistics and education. Students with the highest marks in the arts stream are usually accepted for management and economics courses first, followed by law, political science and education (Al-Makhzoumi, 1982, 95).

The enrolment capacity of each college or institute is also taken into consideration. However, students are not completely free in their choices, and are urged to list as many choices as possible. Competition among the students is the governing factor as to which of the various colleges or institutes will accept them.

In discussing the problem of admission to higher education institutions in Iraq, the most interesting questions are:

1. What kind of discipline do young people completing secondary school decide to continue on to in higher education? and,
2. What factors do they take into consideration when the choose?

Questions 10 and 11 in the questionnaire attempt to throw some light on these issues by asking UOT graduates to indicate their first choice for attending higher education and reasons for wanting to continue their studies in higher education. Important decisions are rarely made for a single reason. Many factors are influential in varying degrees for different people. This fact was recognized in the construction of the questionnaires.

A summary of the responses is given in Table 4-4. This table shows that 54% of the sample had chosen one of the medical fields of study - medicine, dentistry and pharmacy - and the remainder (46%) wanted to study in engineering fields. It would seem that no respondents, in our sample, had chosen any other field of study as a first choice. This is largely because doctors enjoy a high social status in Iraqi society and have a comparatively high income. In a study conducted among students at Baghdad University about their rating of 62 occupations in terms of income, social class and educational level, Al-Zobaic and El-Ghanam found that there was a continum ranging from the garbage man (total mean 1.05) to the professor (6.63), while the doctor rated (6.45) and the engineer (5.95). The nurse was rated rather low (2.62) before the clerk (2.56) on the same rank as the carpenter (2.62) far behind the social worker (4.11) and the secretary (4.27) (Al-Zobaic, 1968).

It is clear why the best students seek places in the medical faculties. But the number of places in the medical faculties is limited, so many must enter other faculties as a second choice - in this case the engineering faculties became the second choice for most students. Similar results were found by Al-Zoubai, et al. They stated -

Distribution of UOT Graduates According to their First Choice and Faculty Graduated.

Table 4-4

First Choice		Faculty Graduated (No.)			Total	
		Mech.	Elect.	Civil	(No.)	(%)
1	Medicine	16	34	9	59	47.2
2	Dentistry		1	4	5	4.0
3	Pharmacy	3		1	4	3.2
4	Mechanical Engineering	[17]			17	13.6
5	Electrical Engineering	9	[4]	4	17	13.6
6	Civil Engineering	6		[9]	15	12.0
7	Architect. Engineering		4	4	8	6.4
Total		51	43	31	125	100.0

> "Iraqi students are distributed to faculties depending on the capacity of these faculties, not on the basis of the student's interests, which are highly concentrated on such faculties as medicine and engineering. Thus the Iraqi higher degree group includes some students who would not have a strong interest in their studies which would affect their performance later at work". (Al-Zoubai, et al, 1973).

Our results also show that there are vast differences between the desired (first choice) and the actual field of study among the people within the engineering field. It is clear that only one student out of four (or 24%) graduated in the field which was already his/her first choice, i.e. more than 75% of the sample graduates were later studying in a field different from the one they desired at the completion of secondary school, Table 4-4. There are also great differences among the UOT faculties. For example the first choice of more than 90% of the engineers who graduated from electrical engineering, was another field of study. This percentage of disappointed students was less in civil engineering (71%) and in mechanical engineering (66%). This might have an influence on their achievements at the university, as we shall see later in this research.

The main reasons for change between the desired field of study after the completion of secondary schooling and actual field of study is the secondary school points which is the only main criteria used in students choosing the higher education system in Iraq.

As we mentioned earlier, the best students seek places in medical colleges. When they fail they accept their second choice which is usually one of the engineering fields. In searching this point in more detail, and depending on the data available throughout the interviews, a

significant variation is found across engineering fields of study. Only 20% of mechanical engineering graduates have more than 80 points on average when they were leaving secondary school. This percentage increased to 35% in civil engineering graduates and to 100% in electrical engineering graduates, Table 4-5.

According to the current research data, graduates in electrical engineering have a mean of 83 points compared with 79 points in civil engineering and 76 points in mechanical engineering. The differences in secondary school mean points suggest that electrical engineering attracts the high score student in Iraq compared with other engineering fields of study. The author's explanation is that electrical engineering jobs might be the white-collar jobs which usually attract the educated people in Iraq.

UOT graduates were also asked to indicate their reasons for wanting to pursue the specific field of study they desired at the completion of secondary school. Among the six reasons offered by question 11, five seem particularly important by more than 50% of the interviewers. These are shown in Table 4-6. It is interesting to note the following:

1. The "parents' wishes" were the most important reasons for pursuing certain fields of higher education, considered by 88% of the sample. This reflects the fact that Iraqi families still have a lot of influence on their son's or daughter's decisions for choosing specific disciplines at higher education.

Graduates by Faculty and Secondary School Points.

Table 4-5 (Percentage)

Secondary School Points	Mechanical	Electrical	Civil	Total
70 - 79	80	0	65	49
80 - 90	20	100	35	51
Total	100	100	100	100
Range points	71-82	80-89	74-76	71-89
Mean points	76	83	79	79.4

2. The second most important reason is the desire to improve social status, which is considered important by 86% of the sample. This desire is very high - 92% among mechanical engineers compared with 72% in electrical engineers and 68% in civil engineers. This is due to the fact that about half of the mechanical engineers (or 49%) came from low class families - in terms of father's occupation (farmers, semi-skilled or skilled) - compared with only 19% in electrical engineers and 13% in civil engineers, as we shall see in the next section (Table 4-13).
3. The other important reason is to secure good employment opportunities - considered important by 78% of the sample. This reveals that the high demand for engineers, as well as doctors in the Iraqi labour market, in addition to other reasons, has encouraged more secondary school leavers to attain these courses.
4. It is interesting to note that the wish to improve their economic situation in terms of a high salary, ranks only in fourth place, and seemed important by 72% of the sample. Why this should be is difficult to explain. It shows either an attitude common among Iraqis to deliberately rank money in second place, or that securing good employment opportunities encompasses, in the pupil's mind, an associated improvement in the economic situation. An additional reason might be that the profession they seek will not drastically improve their economic situation, as we shall see in Chapter 6.
5. Graduates from higher socio-economic backgrounds in terms of the father's occupation, are more likely than graduates from lower socio-eonomic backgrounds, to be motivated by non-economic reasons (social prestige, wish to study...etc.) as shown in Table 4-6. Conversely, graduates from lower socio-economic backgrounds are more

Reasons for Studying at Higher Education as Perceived by UOT Graduates.

(Percentage represents degree of importance)

Table 4-6 (n = 125)

	Reasons	(%)
1	Parents' wishes	88
2	Social prestige	86
3	Good employment opportunities	78
4	High salary	72
5	Wish to study in this field	42

Distribution of UOT Graduates by Sex and Reasons for First Choice.

(Percentages represent the degree of importance)

Table 4-7 (n = 125)

Reasons		Male (%)	Female (%)
A. Economic reasons	1. High Salary	80	19
	2. Good Employment opportunities	79	75
B. No-economic reasons	1. Social prestige	64	94
	2. Wish to study in this field	39	69

Male (n) = 109 Female (n) = 16

likely to be motivated by economic reasons, such as high salary and good employment opportunities.

6. Women are more likely than men to choose higher education for non-eonomic reasons, as shown in Table 4-7. The author believes that this is due to two main reasons. First, according to Iraqi traditions, men are usually responsible for securing a good living standard for their families and the wives rarely shared in these responsibilities, even if they worked. Second, most females in our sample came from high class families and the economic factors in terms of high salary, are not their first priority.

We shall analyse the family background of the sample UOT graduates in the following section, in order to explain the importance of family background on the people's decisions for entering specific fields in higher education.

4.4 THE BACKGROUND OF UOT GRADUATES

Higher education has been viewed in Iraq as an essential element for an individual's economic and social advancement. "Although the desire for knowledge per se is no doubt an important factor among many students, for others, particularly those with a middle or lower class background, the driving force is largely a desire for economic security and social recognition" (Szyliowicz, 1973, 5).

It is clear that there is a factor of prestige and high social status which motivates people to look for higher education everywhere in

the world. In Iraq, the higher education facilities have been greatly extended during the last decade, providing more opportunities for students coming from various parts of the country. But the result of such a trend in terms of social equity are difficult to evaluate on a national level because relatively little data is available about the socio-economic background of the Iraqi students.

Fortunately, the primary results of this research provide basic data about the family background of UOT graduates. These results show that students' educational progress is clearly affected by their family background, and the likelihood of students entering higher education is closely associated both with his/her parents' education and with his/her father's and mother's occupations. Accordingly, this section will begin by analysing the family background of the graduates, firstly in terms of their parents' education, secondly in terms of their parents' occupation, and finally in terms of the region they originated from.

4.4.1 Parents' Education

As shown in Table 4-8, about one-quarter or 24% of UOT graduates had both parents who had no education at all. Meanwhile, 42% of them had both parents who had post-secondary education (almost university education), and a further 14% of the graduates had at least one of their parents who had post-secondary school education. The family background of female graduates, as indicated by their parents' education, was generally more favourable than that of male graduates. See Table 4-9.

UOT Graduates by Father's and Mother's Educational Level.

Table 4-8 (Percentage)

Father's Educ. level \ Mother's educ. level	No-education or few years of elementary	Primary and Secondary	Post Secondary	Total (%)
No-education or few years of elementary	24	1	0	25
Primary and secondary	4	15	0	19
Post-secondary	0	14	42	56
Total (%)	28	30	42	100
Total (No.)	(41)	(31)	(53)	125

UOT Graduates by Sex, Fathers' and Mothers' Educational Level.

Table 4-9

Educational Level	Father		Mother	
	Male	Female	Male	Female
No-Education or few years of elementary	27	13	30	13
Primary and secondary	22	0	34	0
Post-secondary	51	87	36	87
Total	100	100	100	100

The educational background of the fathers differed from that of the mothers, as one would expect. The proportions of fathers who had post-secondary education was 56% and for the mothers 42%, Table 4-8.

However, there were substantial differences between faculties in the proportion of graduates coming from homes where their fathers had no education at all. The proportion of such graduates was 39% in mechanical engineers, 16% in electrical engineers, and only 13% in civil engineers, Table 4-10. The situation was approximately the same in the case of the mother's educational level, and the percentages were 43%, 16% and 19% respectively, Table 4-11. Significant evidence found in this study was the strong relation between father and mother's educational level. It was 0.883 in using non-parsons correlation coefficient (with significance = 0.001).

Unfortunately we do not possess any historical data about the socio-economic background of student population at UOT in order to do a significant comparison. However, a study of biographies of medical graduates at Baghdad University conducted in 1973 by the "Center for Educational Research" provides some comparative information about the education of their parents. (Center for Educational Research, 1973, 12). In such a comparison, there is a clear development of the family background of university graduates in Iraq, in terms of fathers' and mothers' educational level during the last decade, as shown in Table 4-12. The proportion of UOT graduates in 1980 whose fathers had secondary education or more is 71% compared with 46% among medical graduates from Baghdad University in 1973. The development among mothers' education is

Distribution of UOT Graduates by Faculty and Fathers' Educational Level.

Table 4-10 (Percentage)

Fathers' Educational Level	Faculty			Total (%)
	Mech.	Elect.	Civil	
No education or few years of elementary	39	16	13	25
Primary and secondary	22	21	13	19
Post-secondary	39	63	74	55
Total	100	100	100	100

Graduates' Distribution by Faculty and Mothers' Educational Level

Table 4-11 (Percentage)

Mothers' Educational Level	Faculty			Total (%)
	Mech.	Elect.	Civil	
No-education or few years of elementary	43	16	19	28
Primary and secondary	29	42	13	30
Post-secondary	28	41	68	42
Total	100	100	100	100

Comparison of Father's and Mother's Educational Level Between Medical College at Baghdad University and UOT Graduates.

Table 4-12 (Percentage)

Educational level	Father		Mother	
	Medical Graduates (1973)	UOT Graduates (1980)	Medical Graduates (1973)	UOT Graduates (1980)
No education or few years of elementary	41	26	73	28
Completed elementary	13	4	13	8
Completed secondary	21	15	11	22
Post-secondary	25	55	3	42
Total	100	100	100	100

Source: Figures for Medical Graduates quoted from Center for Education Research (1974) Biography of Medical Graduates, Baghdad University in 1973, Unpublished Report in Arabic, (Baghdad University Press, Baghdad, p12).

much stronger. The percentage of UOT graduates in 1980 whose mother had secondary school education or more is 66% compared with only 14% among medical graduates in 1973. In comparing this evidence with the percentage of Iraq people aged between 25-60 years of age, who have had secondary education and more, which was 13% in 1977 (Ministry of Planning, Annual Abstract of Statistics, 1978, 34), one can conclude that medical and engineering education in Iraq was dominated by students coming from highly educated families.

However, care being taken not to generalize, since the Medical College represents the first choice for Iraqi students (while UOT represents almost the second choice) and most of their students at the time of this study in 1973, came from high class families. The number of the sample of this study was 137.

In using the non-parson correlation technique to find the relationship between the parents' educational level and the achievement of their sons or daughters at both secondary and university education, (Blalock, 1964), our results indicated a statistically significant relationship between father's education and mother's education on the one hand, and the student's achievement at secondary school, and then on their success in entering post-secondary education, since the secondary school points are the main criteria used in getting a place at higher education institutions in Iraq.

On the other hand, it is apparent that parents' educational level has a less significant influence on the students' achievement at higher education, in terms of their grades at the completion of higher education, as shown in Figure 4-3. Since there is a statistically

Distribution of UOT Graduates by Fathers' Occupation and Faculty.

Table 4-13 (Percentage)

	Fathers' Occupation	Faculty			Total
		Mech.	Elect.	Civil	
1	Farmers & unskilled	18	5	3	9
2	Semi-skilled & skilled	31	14	10	20
3	Government employees	18	25	19	21
4	Professions	27	42	45	37
5	Contractors	6	14	23	13
Total		100	100	100	100

Distribution of UOT Graduates by Mothers' Occupation and Faculty.

Table 4-14 (Percentage)

	Mothers' Occupation	Faculty			Total
		Mech.	Elect.	Civil	
1	Housewife	64	49	49	55
2	Semi-skilled & skilled	6	2	0	3
3	Government Employees	10	14	19	14
4	Professions	20	35	32	28
Total		100	100	100	100

UOT Graduates by Sex, Fathers' and Mothers' Occupation.

Table 4-15 Percentages

	Occupation	Father		Mother	
		Male	Female	Male	Female
1	Farmers & unskilled	10	6	0	0
2	Semi-skilled & skilled	22	6	4	25
3	Government employee	23	6	12	13
4	Professionals	30	6	18	50
5	Contractors	15	0	5	
6	Housewife			61	12
	Total	100	100	100	100

Comparison Between Fathers' Occupation for UOT and Medical Graduates at Baghdad University.

Table 4-16

	Fathers' Occupation	(No.)		(Percentage)	
		UOT Graduates 1980	Medical Grads.1973	UOT Graduates 1980	Medical Grads.1973
1	Farmers & unskilled	12	12	9	9
2	Semi-skilled & skilled	25	26	20	19
3	Government Employee	26	50	21	36
4	Professionals	46	23	37	17
5	Contractors & Merchants	16	26	13	19
	Total	125	137	100	100

Source: Figures for Medical Graduates 1973, quoted from: Centre of Educational Research, 1974.

skilled workers among the graduates from both universities. As can be seen in Table 4-16, and as the Center concluded that :

> "The social hierarchy does not seem rigid. Whole groups of individuals could move well up the scale in the occupational level. There are clear indications that vertical social mobility is intensive and it is not difficult to change in one generation from a butcher or taxi driver or unskilled worker to the status of a doctor's family. There is a clear case of social mobility through the use of educational institutions, a good example of the teaching profession considered as a social elevator. One could develop a view that in Iraq schools act as an agency of selection - picking certain students and assisting them to move up the social ladder". (Center for Educational Research, 1974).

However, one must observe that this conclusion is correct to some extent among occupations in urban areas, while this type of mobility is still unclear between rural and urban occupations. As we observed that the educated families whose fathers were working in most active and profitable occupations such as professionals, contractors and government employees still dominate the best places in Iraqi universities during the last decade, while the rural families are relatively deprived. This will be made clear in the next section when we discuss the family background of UOT graduates in terms of places where they originated from. However, the next ten years will witness remarkable changes when influences of the compulsory education at primary schools applied in 1978 will bring the students from all Iraqi families in a more balanced form, to higher education at the beginning of the 1990s.

4.4.3 Graduates' Origin

Our sample data revealed that the majority of UOT graduates or 67% originated from the three main cities, Baghdad 47%, Mosul 11% and Basrah 9%. The population of these cities is 44% of Iraq's total population,

as shown in Table 4-17. The variations among the UOT faculties are very clear. 65% of the engineers graduated from the electrical faculty were originally from Baghdad. This percentage dropped to 55% in the civil engineering faculty and to only 27% in the mechanical engineering faculty. Electrical engineering represents the first choice for the new student and attracts the high score leavers, who usually originate from Baghdad, and came from high class and well-educated families.

The high proportion of students originated from the main cities is almost the same in other Iraqi universities, as was found by a similar study conducted at Baghdad University in 1972. It was revealed that 54% of the enrolled students came from Baghdad itself, 12% from Mosul, and 10% from Basrah (Al-Zobaie, 1972). Those totalled more than three-quarters of university students in 1972. This high proportion resulted from the availability of secondary schools in the main cities. More than 75% of the total number of secondary school graduates came from these cities. Such unequal distribution can be attributed mainly to the fact that most secondary schools are located in urban areas. Also, secondary schools in larger towns always have better facilities and more qualified teachers. Thus they provide a higher quality of education, which enables students to do well in the baccalaureate examination, which determines admission to an institution of higher education.

The major step in democratization and increasing the proportion of the other cities in university places would be the creation of more secondary schools outside the main towns. This should be the main target for the educational policies in Iraq for the next few years, after the application of compulsory education at primary level in 1978,

Distribution of UOT Graduates by Faculty and Province of Birth.

Table 4-17

Province	Faculty			Total (%)	Iraqi Population (%)
	Mech.	Elect.	Civil		
Baghdad	27	65	55	47	27
Mosul	25	0	3	11	9
Basrah	8	7	13	9	8
Other Iraqi provinces	40	28	29	33	56
Total (%)	100	100	100	100	100

Source: Population figures quoted from:-
Ministry of Planning (1978) Annual Abstract of Statistics -1978 (Central Statistical Organization, Baghdad).

which will bring up a large number of students to secondary schools after six years and then a large number to the university after another six years. This is supposed to start in 1990.

4.5 SUMMARY

Since the beginning of the seventies, higher education policies in Iraq have been concentrated on satisfying the individual (social) demand for higher education, as well as the training of high level manpower needed for the development. The results of current research presented in this chapter revealed that, in spite of a tremendous increase in places at higher education institutions during the 1970s, it is still lacking beyond the individual demand for this level of education. Many factors are behind that, such as the high birth-rate, internal immigration, free education at all educational levels, increasing living standards of the Iraqi people...etc. It is expected that the pressure for more places will become more acute in the next few years.

The study found that medical studies represent the first choice for the majority of secondary school leavers, while engineering studies represent the second choice. In searching the main factors which are influencing the preference of specific fields of study at higher education level, our results reflect that the "parents' wishes" and the "social prestige" are the main reasons behind that. While the economic factors, such as securing good employment opportunities and higher salary, came in second place. This is partly due to the majority of our sample, as well as the students at other Iraqi universities, come from high class and well educated families.

However, the author believes that this situation will drastically change during the next few years, as a natural result of the application of free education at all educational levels since 1974, and the compulsory education at primary education since 1978.

CHAPTER 5

THE UTILIZATION OF ENGINEERS IN IRAQ

5.1 INTRODUCTION

In this chapter we turn our attention to the labour market for engineering manpower in general and for UOT graduates in particular. There are a number of reasons for choosing to focus on this particular group. There has been a heated debate about the possibility of shortages of such types of manpower in Iraq and the detrimental effect this imbalance might have on the dynamic performance of the economy. This question is of great importance, given the long training period required to produce manpower of this kind and the large sums of money involved, much of it from the public purse.

The few studies on Iraqi highly qualified manpower (HQM) were conducted in the last two decades (see for example Ministry of Planning, 1974, Human Balance Sheets; Ministry of Planning, 1977, Employee Survey for 1976, and Ahmed, 1978). However most of those studies were descriptive and quantitative studies. The gap in the measurement and explanation of the work experience of the HQM in general, and engineering manpower in particular, have still not taken place in any of these studies. Little effort was made to classify the responses of the individuals about their work into attitudinal types. The basic problem with these studies is that they ignore what happens to, or what the Iraqi engineer thinks of his or her job - that is how effectively or ineffectively he or she is utilized.

A study of the utilization of Iraqi engineers is important. Since 1974 the government has invested and continues to invest in the production of engineering manpower both locally (undergraduate) and abroad (post-graduate). Whether the products of this investment are in

a position to achieve the goals expected of them cannot be assessed and understood only by quantitative expressions and projections of manpower needs, as is currently the case with many of Iraqi manpower studies. For a balanced understanding of the manpower situation for engineers and other HQM the quantitative (supply and demand) expressions ought to be complemented with qualitative assessments of the work experiences and attitudes of those already trained and working. Stated more succinctly, the utilization of human resources, has a qualitative as well as a quantitative dimension; perhaps the latter could be more important in developing countries where the real shortages in the number of engineers is more acute (Ukaegbu, 1985, 505).

The same observation could be made of the voluminous literature on science and technology in developing countries in general. (Nader, 1969), and Iraq in particular. (Ahmad, 1978). Much of that literature emphasizes the structural constraints to scientific and technological development without pinpointing the relative importance of these constraining factors. This tends to result in normative prescriptive conclusions, regarding the role and operation of scientific and technological activities without adequate attention to the work world of the scientific and technological practitioner (Ahmad & Blang, 1973).

Although there has been a large increase in the number of engineering stock, and according to the official government reports (The Central Report 1983), the problem of a shortage of engineers remains unsolved. This shortage can be explained from the following points of view:

First, the present engineering stock in Iraq may be ineffectively utilized (or under-utilization) in terms of (a) the relevance between their current jobs and university education, (b) their total working time, and (c) the proportion of their time spent on engineering activities.

Second, the quality of graduates may be low which leads to a fall in the productivity of the graduates in their current jobs.

The present chapter will concentrate on the discussion of the first issue, while the second one will be discussed in Chapter 7. The remainder of the chapter is divided into four sections. In section 5.2 some thought about the importance of efficient utilization of HQM will be explained briefly. In section 5.3 we will examine historical trends of the engineering stock, and consider the extent to which it has inflated in recent years. Section 5.4 discusses the criterion used in this study in order to measure the utilization of engineering manpower in Iraq in terms of the relevance between their current jobs and university education, and the main reasons which have influenced this problem. In section 5.5 the allocation of working time among the main activities and the time spent on engineering activities compared with other non-engineering activities will be discussed. The author hopes that discussing these issues will help to draw a general profile about the utilization of UOT graduates as well as other HQM.

5.2 IMPORTANCE OF EFFECTIVE UTILIZATION OF HQM

One of the ways of ensuring that the available stock of engineers and other HQM is sufficient to meet the demand for such personnel is through the best possible utilization of their talent. The problem of the need for better utilization of HQM has so far been recognized in the United States where there has been a committee for the utilization of scientific and technical manpower since 1961 (Catherine, 1982), and in the U.K. since 1964 (OECD, 1967). This problem has recently been given much attention in Iraq, not only because engineers are considered a necessary factor for increasing the productivity of industrial enterprises, which is low in most of them (Penrose, 1979, 471), but also because the preparation of people to become engineers is very long and costly. The case is usually the same in other specialities such as doctors, managers, lawyers...etc.

The emphasis on the effective utilization of human resources and specifically the HQM is perhaps best described by White who stated:

> "Human beings are the life blood of a nation. The viability of a society depends on the strengths and skills, the attitudes and behaviour of the people in it. To achieve its maximum potential, a nation must nurture and employ its human resources with even greater care than it develops its material endowments" (White, 1972).

In fact, this idea is not new. Since the eighteenth century, Adam Smith focused on the investment in education in order to supply not only graduates, but qualified and skilled manpower, who could play a real role in a country's development (Smith, 1930). Most economists would probably agree that it is the "human resources" of the nation, not its capital nor its material resources, that ultimately determine the

character and pace of its economic and social development. Harbison's view, like those of human capital theorists, regards human resources as "the engine of production growth" (Harbison, 1973). A recent and perhaps somewhat extreme version of this position - especially in view of the recent experience of the Arab oil states, including Iraq - has been expounded by Professor Harbison who argues that:

> "human resources....constitute the ultimate basis for the wealth of nations. Capital and natural resources are passive factors of production, human beings are the active agents who accumulate capital, exploit natural resources, build social, economic and political organizations, and carry forward national development. Clearly, a country which is unable to develop the skills and knowledge of its people and to utilize them effectively in the national economy will be unable to develop anything else". (Harbison, 1973).

The main proposition of his analysis is that the goals of development should be the maximum possible utilization of HQM in productivity and the fullest development of the skills, knowledge and capabilities of the labour force.

The HQM utilization studies are very well developed in most advanced countries. For example in U.S.A. recent studies by Solmon have attempted to evaluate the utilization of undergraduates in the labour market. His findings reveal that about 50% of the respondents (total sample was 28,589 undergraduates) indicated that their jobs are closely related to their specializations, while 26% indicated that they were not at all related. (Solmon, 1976).

A more recent study of the engineering labour market in the U.K. indicates a similar result. The study examined data from 12 British firms (the study covered some 500 engineers) and concluded that "25% of

the sample of people with engineering qualifications were working in non-engineering jobs" (Mace, 1975). The authors of the study found the possible reason was that there was no rigorous line between an engineering job and formal education. Experience and on-the-job training were at least as important as formal education to the successful performance of engineering jobs, and people without formal qualifications seemed able to compensate for any lack of formal education through the alternative means of acquiring engineering skills. (Mace, 1983, 24). If this possibility works in the U.K. where there are many routes for engineering jobs, rather than the academic one, (Finniston, 1980), it does not work in the Iraqi case, and most other Third World countries, where obtaining a degree in the engineering subject area is the only means of entering into engineering jobs.

The relationship between the higher education system and the labour market and the utilization of HQM in developing countries is the subject of several studies conducted by "Unesco International Institute for Educational Planning (IIEP)". For example the IIEP launched a research on employment of university graduates of the Sudan in 1981. Research results show that the proportion of those who are working in fields other than their specialization at university ranged between 50% for social science graduates, 36% for natural scientists, 11% for business and management graduates, and 6% only for engineers (Sanyal, 1981, 159).

Another case study carried out by the IIEP in 1982 was based on 1712 university graduates in the Arab Republic of Egypt. The study found that although the total proportion of graduates who were working in jobs other than their specialization at university was only 8%, but

the breakdown of this proportion between major fields of specialization ranged between 20% for economic graduates to 0% in medicine, and veterinary medicine graduates (Sanyal, 1982, 155). No detailed figures were found for engineering graduates.

Recently a study carried out by Ukaegbu looking for the effective utilization of Nigerian scientists and engineers in 1980, found that "there was a tendency among some HQM to be absent from their offices. This was to be greater among the middle and lower cadres of HQM, than their higher ranking counter-parts". (Ukaegbu, 1985, 505). He added "that may be the former group have less work to do than the later group". He suggested many reasons behind that, such as a bureaucratic system in which top officials were overworked, while their subordinates were under-utilized, and the superiors were reluctant to delegate responsibility to their subordinates. Hence, he concluded that "the under-utilization of Nigeria's scientific and technological manpower seems evident". However, to measure the manpower utilization he suggests some indicators, which are not used in the above study, to provide further insights into the quality of utilization HQM, such as the approximate number of official hours used for the performance of official tasks and that used for pursuit of personal problems; the approximate number of hours lost due to lateness in arriving at work, and the degree of match or mismatch between the content/level of education and the task performed (Ukaeghu, 1985, 511). Most of these indicators will actually be used by this study, as we shall see later in this chapter.

In Iraq, since 1975 when the National Development Plan 1976-80 was issued, it was clear that there was a need for better utilization of the current stock of highly qualified manpower and for a better link between higher education institutions and the world of work. (Ministry of Planning, 1978, National Development Plan 1976-80). In this chapter attention is focused on utilization of engineering education by UOT graduates at work. The importance of this kind of education for the national development is the main recommendation for many studies. For example, a joint report of Unesco and the "Arab Organization For Education, Culture and Sciences" Conference indicated:

> "Engineering education must train the qualified personnel needed for national development plans, must be closely related to the world of work and must prepare students for that world by providing them with the necessary skills and aptitudes. It is important in this respect to pursue and intensify the efforts already undertaken to improve the quality of engineering higher education systems, adapting them to existing and anticipated requirements". (Unesco and Arab Organization, 1980, 95).

In this context, an analysis of ineffective utilization of the training received by graduates, in terms of the skills needed by the job, can provide useful information for the Iraqi decision makers to solve the shortage of qualified manpower. It would also improve the relationship between higher education and the world of work.

As we mentioned earlier in this chapter, the principle institutional mechanism for developing the human skills in Third World nations has been and still is the formal educational system. Most Third World nations have been led to believe or have wanted to believe that "it is the rapid quantitative expansion of formal educational opportunities which holds the basic key to national development. The

more education, the more rapid the anticipated development" (Todaro, 1975, 229). But, after almost two decades of rapidly expanding enrolments experienced in Iraq, and millions of dinars of higher educational expenditure, the problem of HQM shortage remains unsolved. It is made clear when one important official report still insists that the principle obstacles facing industrial sectors in the mid 1980s are: (The Central Report, 1983)

1. Low standards of technological manpower.
2. Imbalance between the engineering/technical manpower in both qualitative and quantitative aspects.
3. Underutilization of HQM in some industrial enterprises in public sectors.

Therefore, it is not surprising that Iraq has become aware of the urgent need to examine her utilization of HQM and especially engineers, which is one of the main purposes of this chapter. But before doing that, it is worthwhile to examine briefly, the situation regarding the engineering stock in Iraq.

5.3 THE DEVELOPMENT OF ENGINEERING STOCK

In Iraq the major financial resources for the development programmes came from the oil revenues which represented between 77-95% of total investment in the development programmes over the period 1970-1980. As a direct result of the nationalization of oil wealth in 1972, and the huge increase in the oil prices in 1973, government revenues increased from $2.9 billion in 1970 to $29.9 billion in 1980. (E.I.U., 1980). Since then a large proportion of this revenue has been devoted

to the development programmes. The achievement of development objectives is lagging behind the targets, when for example, the government could not spend more than 70% of the allocations in the 1970-74 plan, the delaying of many projects' achievements, and the difficulties in running some others. This was because there seemed to be unanimity of opinion among many authorities that the underlying factor behind this problem was the shortage of HQM, particularly among engineers.

The government, accordingly, put enormous pressure on higher education institutions to expand their capacities and enrol more students in order to increase the number of graduates in the most needed areas of specialization, namely engineering, administration, education and agriculture. As a result of this pressure significant changes in the total numbers and proportion of graduates from universities can be noted during the 1970s as shown in Table 5-1. Accordingly the annual number of graduates from all engineering schools in Iraq, including the UOT, increased from 654 engineers in 1970 to 1514 in 1975 and then doubled to reach 3060 in 1980 (Unesco, 1970 and 1980). In the technical studies (below university degree) while there was no graduates in 1970, the establishment of 14 institutes during the 1970s led to an increase in the number of graduates to reach about 6000 in 1980.

As a result of these developments in the number of engineers graduating during the last decade, the total engineering stock increased from 6.7 thousand in 1970 to 19.2 thousand in 1980. The most significant indicator here is the number of engineers per 10 thousand population. This average more than doubled over the same period. It increased from 7 to 15.

Distribution of New Graduates from all Iraqi Universities by Field of Studies (1970-1980).

Table 5-1 (Percentage)

	Specialization	1970	1980
1	Engineering Sciences	8.4	19.3
2	Medical Sciences	8.9	5.4
3	Business & Economics	11.8	24.5
4	Human Sciences	42.4	13.0
5	Natural Sciences	16.6	10.8
6	Education	7.0	17.0
7	Agriculture	4.9	10.0
	Total (%)	100	100
	(No.)	(7774)	(15824)

Source: Ministry of Higher Education, Annual Report for 1980, (Baghdad University Press, 1981).

In comparison with similar institutions in other countries, Iraqi universities appeared to have a majority of graduates in engineering in recent years. For example, the average number of engineers graduating in 1980 per 100 thousand population was 48 in Iraq. It was just less than in U.K. and higher than the average in West Germany. This average in Iraq was very high in contrast with some other developing and Arab countries, as shown in Table 5-2. It is interesting to note that the ratio of engineering graduates to total higher education graduates was also high even if we compare it with some developed countries. For details see Figure 5-1.

In spite of all these developments in the number of engineering graduates and then in engineering stock during the last ten years, many government reports still claimed that the problem of a shortage in engineering was still acute at the beginning of the 1980s. For example, the National Development Plan for the years 1976-80 estimated that the demand for new engineers would be 33,000 while total supply would not exceed 12,000. (Ministry of Planning, 1976, Proposed Plan for Educational Sector). However, care must be taken about these figures since forecasts have not been made according to the expected changes in both "gross domestic products" or "national income" which are very important indicators in such forecasts (Ahmad & Blang, 1973).

There is no up-to-date figures regarding this situation in recent years. However, manpower demands for engineers are not expected to decrease in the near future - rather, they are expected to rise for some

Number of Engineers Graduated per 100 Thousand Population - In Some Selected Countries (*)

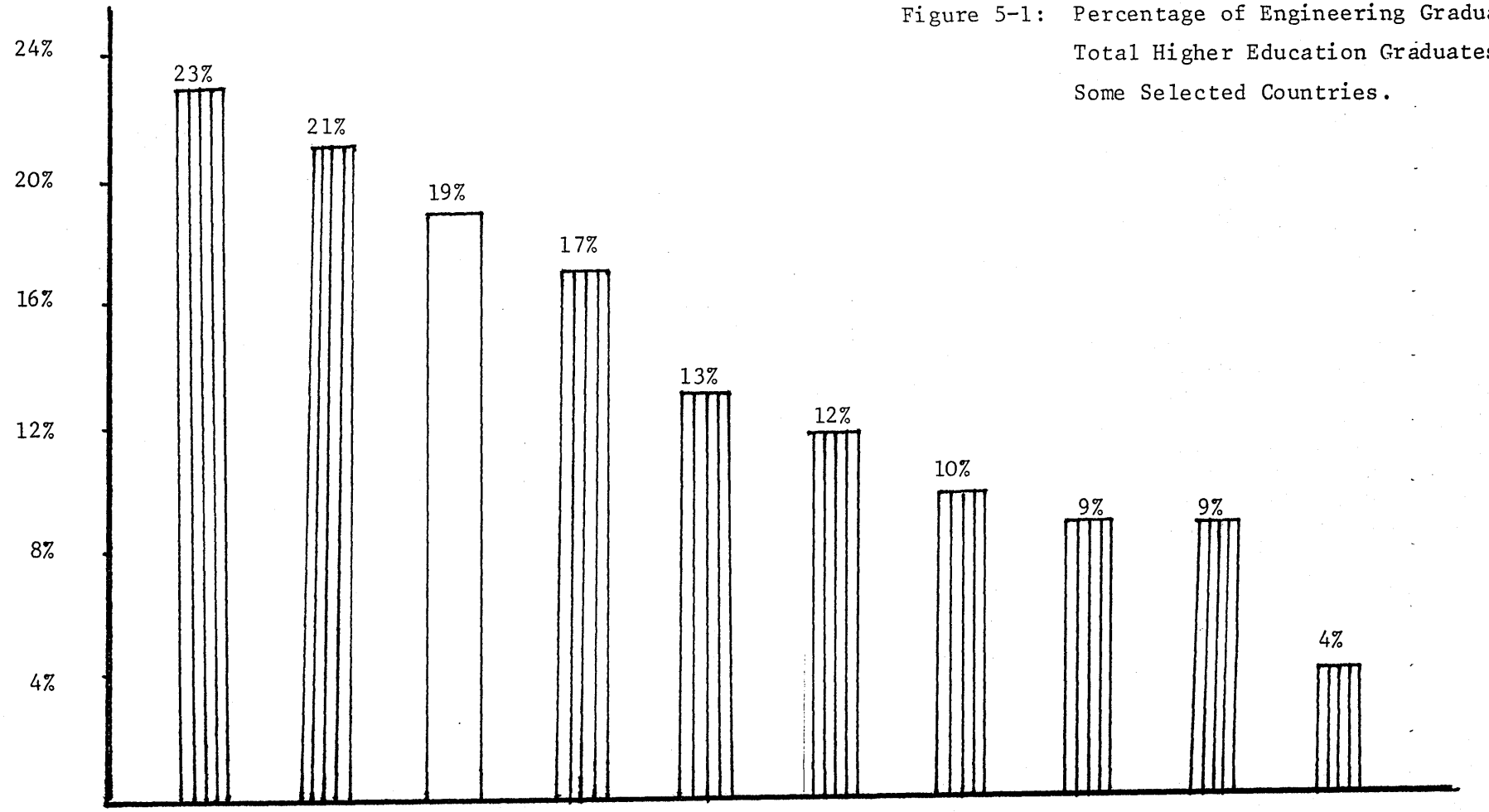
Table 5-2

	Country	Year	Engineers Graduated per 100 Thousand Population
1	Japan	1979	83
2	United States	1980	70
3	Hungary	1980	58
4	United Kingdom	1980	54
5	Iraq	1980	48
6	West Germany	1979	38
7	Egypt	1980	23
8	Saudi Arabia	1979	7
9	Algeria	1980	4
10	India	1978	4

(*) Percentage calculated from:

Unesco Statistical Yearbook, 1983 (Unesco, Paris, 1983).

Figure 5-1: Percentage of Engineering Graduates
Total Higher Education Graduates in
Some Selected Countries.



Source: Percentage calculated from: Unesco Statistical Yearbook, 1983 (Unesco, Paris).

obvious reasons. Engineering departments in most Iraqi universities are understaffed. Further personnel will be demanded by some new industries in Iraq. Emphasis on agriculture continues to increase, and the construction industry will continue to expand with the demand for physical infrastration. The need for engineering manpower, therefore, cannot be overemphasized especially upon the realization that Iraq has a largely under-developed economy.

The need for more engineering manpower is one thing, and effective utilization of those already deployed is quite another. Everyone can realize that the latter has a greater influence on the former. So the author believes that it is wrong to emphasize and focus on one dimension of the problem, which is only the number of engineering graduates. It is also wrong to believe that to solve such problems we just need to increase the number of graduates and neglect all other factors affecting it; this is what occurred in Iraq during the 1970s. No attention has been given to the other aspects of this serious problem which are the effective distribution and utilization of the available stock of engineers and other HQM. The author therefore believes that the main problem of the present shortage of engineers and other HQM is that -

> "Iraq has suffered from an ineffective utilization, and under-employment of HQM, especially among engineers. This could be the main reasons for the current shortage of engineers and other HQM in Iraq".

In the absence of sufficient data on overall Iraqi economy to confirm this argument, we will try to trace a sample of UOT graduates

into the labour market in order to examine the actual utilization of these engineers, in terms of the relevance between the jobs they hold and their university education (Section 5.4), and the average hours spent in engineering activities (Section 5.5). These are the main two issues to be discussed in the following sections.

5.4 OCCUPATION - QUALIFICATION RELEVANCE FOR UOT GRADUATES

In this research, the first criteria used in measuring the utilization of UOT graduates is the relevancy of the present job to his or her field of study at UOT, while the second is the average hours spent in engineering activities. Regarding the first criteria, it is not quite right to think that the link between educational attainments and the current functional distribution of HQM as being quite straightforward, with individuals flowing out of higher education systems with their university degrees into the specific type of occupations. Things are more complicated than this, since classification of occupations for HQM in the labour market is not synonymous with university degrees. However, this problem might be less complicated among the occupations and qualifications in specific fields such as engineers, where most of their training is devoted to specific skills required by specific occupations.

It is obvious that the graduate who studies electrical engineering but later works in any other non-engineering field, or even in other engineering fields such as mechanical engineering, may have wasted a large part of his time studying the wrong industrial speciality. It is inevitable that a lot of industrial technology is not used by some engineering graduates. However if a large proportion of graduates

trained in one speciality enter an unrelated occupation, there is a possibility that most of the specializaton is wasted, particularly among engineers where most of their training is devoted to specific skills. It is therefore important to know the proportion of engineers who are working in other or non-engineering fields as a significant criterion in measuring the effective utilization of UOT graduates.

For the purpose of the present study it can be argued that "ineffectively utilized" occurs when an engineer holds a post, even a high-level post, which in no way corresponds to the training he or she received at UOT; under-utilization occurs when an engineer works less than his or her official hours and spends little time on engineering activities during his or her official working hours.

Getting these kinds of data is not an easy task, especially in developing countries like Iraq, where great difficulty exists in classifying the occupations of engineers and when the job title almost gives no idea about the real work and its contents. However, during the interviews, the researcher tried to get the actual name of the job, and also through the distribution of working time of the interviewees in their present jobs one can get more precise information about the content of their daily work.

Another problem which needs to be considered in measuring the relationship between the engineers' occupation and their university specialization, is defining the main categories of occupations for the engineers. However, there is almost a consensus among the specialists

in this field about the four major groups (see for example Berthoud, 1980, and OECD, 1973). These are:

1. Occupations which require a specific field of engineering and are held by engineers graduated from the same field (faculty).
2. Occupations which require a specific field of engineering but are held by the engineers graduated from other engineering fields.
3. Occupations which require technicians below the university level, but actually occupied by engineers.
4. Occupations which require a university level of education but in non-engineering fields, or some time even below the university level, and are nevertheless held by engineers.

As we are dealing with the utilization of engineering education in the present jobs of UOT graduates, the first group represents the best utilization of engineering education at work, i.e. the content of the present job has a high proportion of the same engineering specializations. The second group represents the utilization of some engineering education, but in the main specialization there is a waste. In the third group, although some of their specialized knowledge may be useful, but since this type of work could be carried out by other, or even less qualified people, using engineers in these occupations represents a waste of advanced engineering education. Finally, the fourth group represents totally useless employment of specialized engineering education, although some general knowledge which could be acquired throughout social science courses during university education may be needed. This is demonstrated in Figure 5-2.

Figure 5-2: Classification of Occupation of 601 Graduates According to the Utilization of Engineering Education.

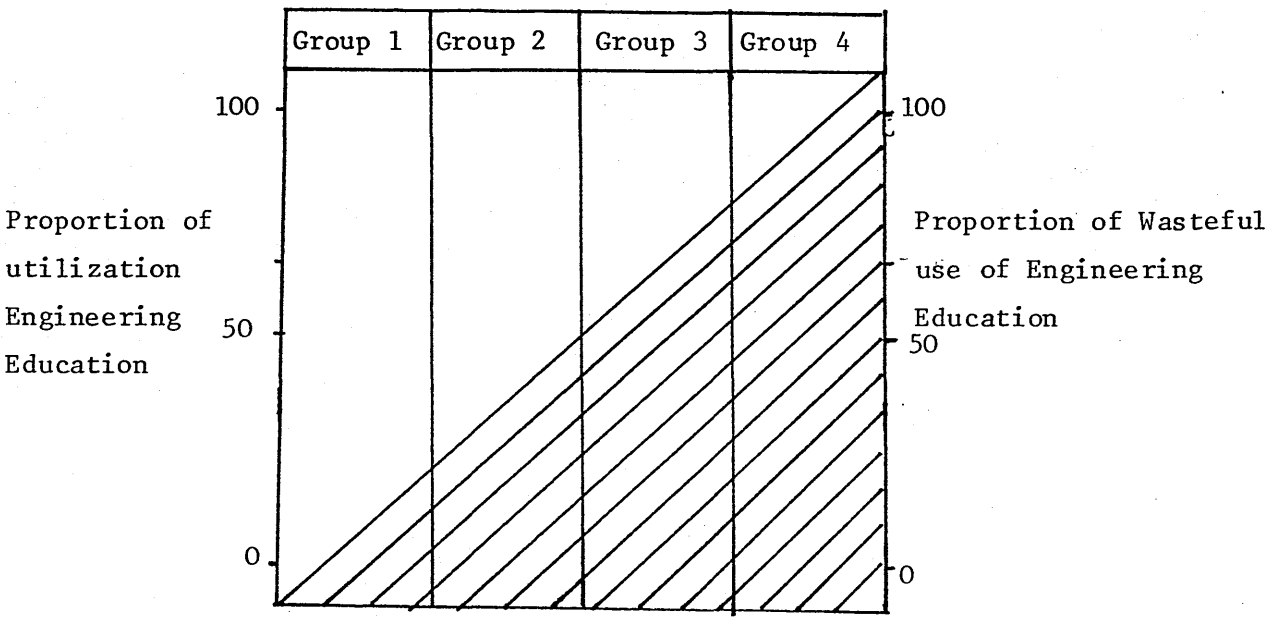


Figure 5-3: "The Occupation-Education Attainment" Matrix.

Occupation	Engin.-Educat. Attainment		
	Mech. Eng.	Elect. Eng.	Civil Eng.
Mech. Eng.	G1	G2	G2
Elect. Eng.	G2	G1	G2
Civil Eng.	G2	G2	G1
Other Fields of Eng.	G2	G2	G2
Technician's Jobs	G3	G3	G3
Managerial Jobs	G4	G4	G4

G1 = Group one
G2 = Group two
G3 = Group three
G4 = Group four

Thus each set of functions must be studied from the educational attainment it needs, to specify the range of engineering education required for functional performance. Therefore all occupations for the UOT sample graduates should be arranged sequentially in terms of engineering education. This analysis, theoretically, can be presented in a form of an occupations-engineering education attainment matrix as is shown in Figure 5-3. This chart represents the ideal structure of occupations in the industry by which all engineering occupations are classified according to the corresponding functions. This matrix, the occupations-educational attainments. is important and useful in evaluating the structure of occupation and the utilization of the UOT graduates at their present jobs.

The important point is that the classification of the present jobs of UOT sample graduates among the above categories are almost entirely based on the engineers' own assessment of their jobs in response to direct question in interview. Only occasionally has the discussion between the researcher and the engineers interviewed influenced the category into which a present job has been classified.

According to the result of current research, one can observe significant variation between the actual structure and the theoretical or the ideal structure which is presented in Figure 5-3. The proportion of UOT graduates outside the shaded area of Figure 5-3 is 60% of our sample, i.e. only 40% of UOT sample graduates are employed in jobs related to their field of study at UOT. (Group 1), 21% are working in other engineering fields (Group 2), 16% are working in technical jobs

(Group 3), and about 23% are working in other non-engineering fields (Group 4), as shown in Table 5-3A and Table 5-3B.

There are significant variations among the engineers graduated from different faculties. For example, the proportion of engineers working in their major field was 47% among electrical engineers, while this percentage decreased to 42% and 33% for civil engineers and mechanical engineers respectively. See Figures 5-4 and 5-5, i.e. two out of every three mechanical engineers were working in other or non-engineering fields.

What precisely these results mean is that a high proportion (60%) of UOT graduates are not effectively utilized and are employed on functions that could be just as effectively carried out by other qualified individuals, such as administrators, programmers...etc., or even less qualified individuals, such as technicians, clerks...etc.

Two possible explanations might be causing this situation:

First: The number of new engineers (supply) exceeding the vacancies for graduates (demand) in the Iraqi labour market. Hence many engineering graduates facing difficulties in finding jobs in their specializations, which lead them to accept any jobs, even if those jobs are in other or in non-engineering fields. Where this is the case, it could be the answer for many claims repeated by some official reports about the shortage of engineers. One can say that such claims are artificial and not real.

Distribution of UOT Graduates by Field of Present Job and Specializations.

Table 5-3A (Percentage)

Field of Present Job		Specialization			Total (all groups)
		Mech.	Elect.	Civil	
Group 1	Mechanical Eng.	33			40
	Electrical Eng.		47		
	Civil Eng.			42	
Group 2	Chemical Eng.	14			21
	System Control & Comp.Eng.		9		
	Architechtural Eng.			10	
	Fabricating Eng.			16	
	Air Cond. & Heating Eng.	11	2		
Group 3	Technical Drawing	10		16	16
	Technical Maintenance	14	7		
Group 4	Admin. Work Only	10	16	13	23
	Social Work Only	4	5		
	Programming	4	14	3	
Total	(%)	100	100	100	100
	(No.)	(51)	(43)	(31)	125

Distribution of UOT Graduates' Sample by Field of Specialilzation and Employment.

Table 5-3B (Percentage)

	Field of Specialization of and Employment	Special-izaion	Employ-ment
1	Mechanical Eng.	40.8	13.6
2	Electrical Eng.	34.4	16.0
3	Civil Eng.	24.8	10.4
4	Chemical Eng.		5.6
5	System Control Eng.		3.2
6	Architechtural Eng.		2.4
7	Fabricating Eng.		4.0
8	Air Conditioning & Heating Eng.		5.6
9	Technical Drawing		8.0
10	Technical Maintenance		8.0
11	Administrative Work		12.8
12	Social Work		4.0
13	Programming		6.4
	Total (%)	100	100
	(No.)	125	(125)

Figure 5-4: Distribution of UOT Graduates by Field of Present Job and Specialization.

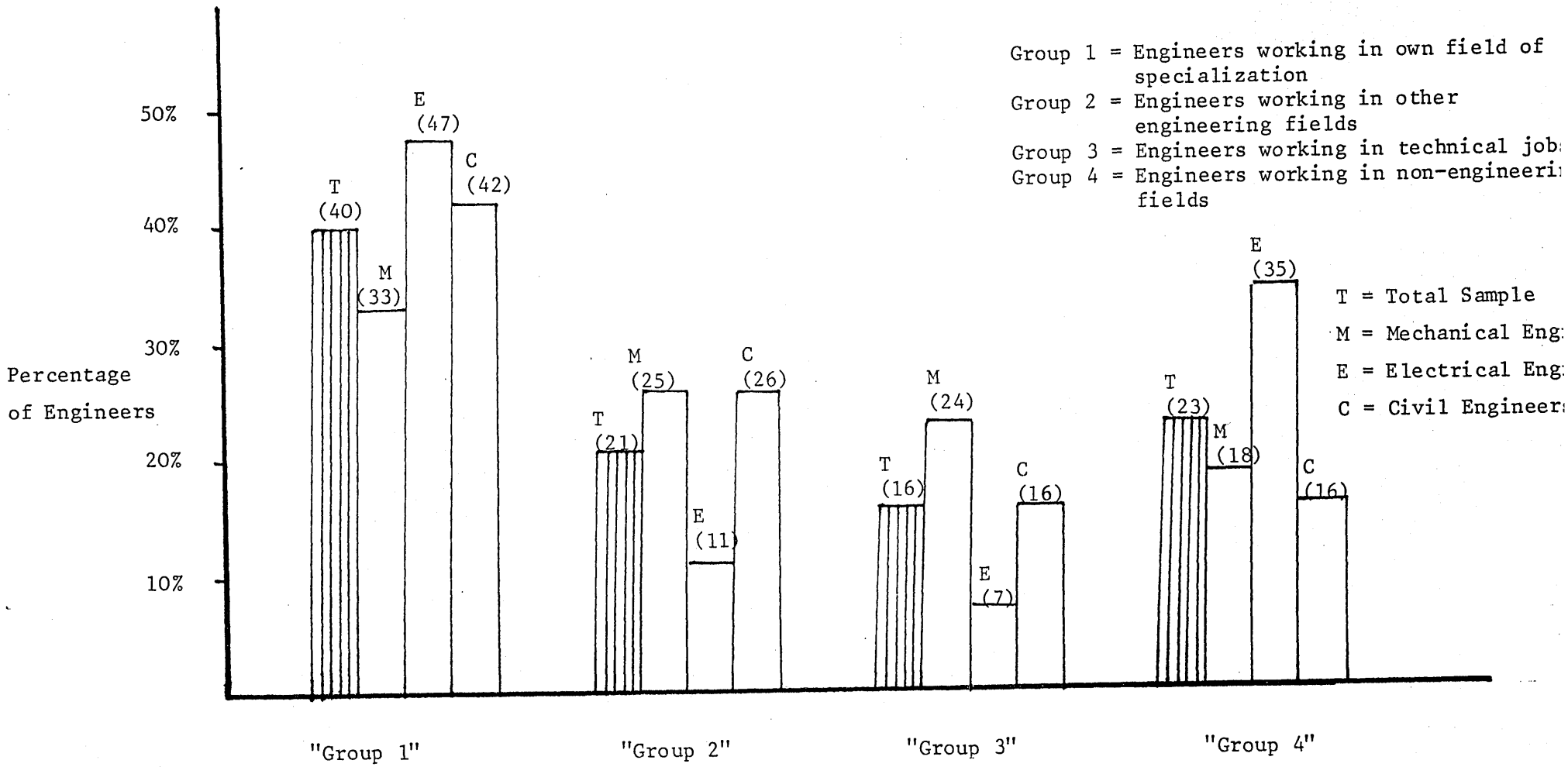
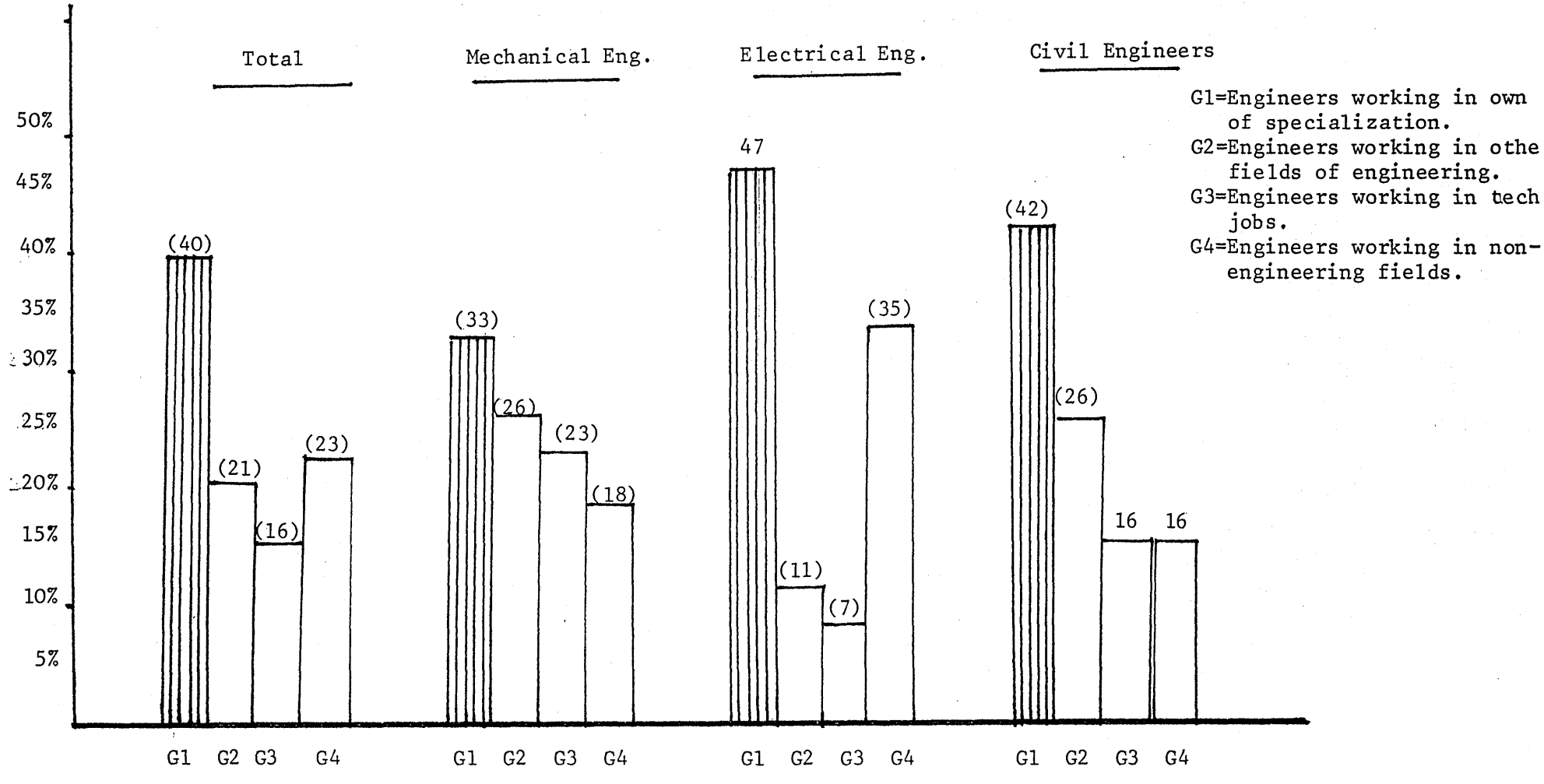


Figure 5-5: Distribution of UOT Graduates by Field of Present Job and Specialization.



Second. which is more possible according to the research results, the present recruitment policies are inappropriate and causing what is usually called "mal-distribution" of the engineering graduates. The new graduates finding themselves in irrelevant jobs. This is the point to which we will return in Chapter 6.

These results reveal as a primary indicator, that the UOT graduates and may be other HQM. are ineffectively utilized, in terms of the relevance of present jobs to their university education. This will be made more clear when we discuss the average working hours spent in engineering activities later in this chapter.

Recent research conducted by R. Berthoud and D. Smith studying the distribution of British engineers by occupation and specialization, and using almost similar classification, found that the proportion of those engineers who are working in non-engineering fields is very low compared with our result. as shown in Table 5-4. However, this proportion increased among the older British engineers as a result of the departure from engineering and holding non-engineering posts, mostly top-administrative jobs (Berthoud, 1980, 29). This comparison shows that the proportion of younger engineers in Iraq who are working in non-engineering fields is substantially high.

In comparison with other countries, one can find different proportions of engineers who work in jobs unrelated to their education. For example, a study conducted by A. Page in France, describing the status of engineering graduates in 1963 found 11% of the sample (which

Comparison of Current Occupation of Iraqi and British Engineers (*)

Table 5-4 (Percentage)

	Occupation	Iraqi Eng. (Aged 25-29)	British Eng. (Aged 20-29)	British Eng. (Aged 50-59)
1	Engineering specification	40	59	40
2	Engineering - all others	21	31	20
3	Non-engineering	39	10	40
	Total (%)	100	100	100
	(No.)	(125)	(158)	(821)

(*) British figures quoted from

Berthoud R. and Smith D., The Education, Training & Careers of Professional Engineers (Department of Industry, London, Her Majesty's Stationery Office). p.29.

was 482 engineers) engaged in work unrelated to their university education. (Page. 1966. 106).

Another similar study, searching the status of electrical engineers conducted by the "Association of Swedish Electrical Engineers", observed that about 23% of their engineers were working in jobs unrelated to their field of study at higher education (such as sales, administration...etc.) The study included 892 engineers who represent about 30% of the Association of Swedish Electrical Engineers members. (Halden. 1966. 203).

Although the situation of engineers employed in work unrelated to their fields of study at higher education is not unique in Iraq, the high proportion of this group (60%) compared with other countries (10% in U.K., 11% in France and 23% in Sweden) represents a great waste of engineering education and of the talents acquired at university level which are badly needed in the Iraqi economy at a time when the government devoted great efforts and resources in the developing process.

Actually this situation is not restricted to engineers only. A study carried out by Al-Jenabi, researching the utilization of agriculturists in Iraq, found that 5,285 of agricultural college graduates were working outside the agricultural sector in 1976. This figure represents about 35% of the total stock of agriculturists at that time (Al-Jenabi. 1980).

The above results show that Iraqi engineers (and may be other HQM, such as agriculturists) are probably ineffectively utilized. It is worthwhile at this stage to seek the main reasons why UOT graduates (and may be other HQM) accept jobs unrelated to their university education. This is the subject of the next section.

5.4.1 Reasons for Working in Other Fields

In order to find the main reasons affecting some UOT graduates working in other fields, the interviewees were asked to indicate the main reason(s) why they were working in occupations irrelevant to their university education. (See Appendix 1, Q19A-Q19E). Five possible reasons were given and the respondents were asked to indicate the degree of importance for each one, and to add any other reason(s) they believed was important. In analysing such answers, we will consider two sets of data; first, the direct responses of the sample interviewees these represent the apparent reasons, second one can analyse the major characteristics of the two groups (Group 1, and Groups 2, 3 and 4 altogether) to find other reasons, which the interviewees may not have wanted to declare.

The summary of the response pattern is provided in Table 5-5. Clearly two main reasons are outstanding as important to most of the respondents. "Obligation to work with government enterprises" and "present job in my home town" are regarded as "very important" or "important" by large numbers of interviewees, whose occupations and university education were in different categories.

Reasons for Working in other Fields Other Than Their Major Specialization at UOT. (N = 75)

Table 5-5

	Reasons	Specialization (%) (1)			
		Mech. Eng.	Elec. Eng.	Civil Eng.	Total
1	Obligation to work with Government	95	92	90	92
2	Present job (P.J.) in my home town	79	85	76	80
3	New experience in P.J. (2)	42	6	71	61
4	Better career in P.J.	74	19	59	48
5	Higher salaries in P.J.	26	4	24	17
6	Less supervision in P.J. (2)	19	6	9	13
7	Unable to find job in my specialization	0	26	7	12

Notes: (1) Percentage represents those considered the reason "very important or important".

(2) Those reasons were not given in the questionnaire, they were added by the interviewees. Total number of respondents are 29 and 16 respectively.

Surprisingly, the economic factor in terms of higher salary, has a relatively weak influence on choosing a job in other fields, as shown in Table 5-5. The researcher believes that this is due to the following reasons: firstly, there are only small differences between the salaries of different types of engineers in Iraq, secondly, as we have seen in Chapter 4, the majority of UOT graduates came from high class families, and slight differences in the salary of various jobs are of little interest to them. which means that non-economic factors have a strong effect on choosing jobs in other or non-engineering fields. For example, the social prestige of getting a job in an enterprise located in Baghdad or in other main cities has a considerable effect, even if such jobs are in other or non-engineering fields, as shown in Table 5-6 (more detail about this phenomenon will be shown in Chapter 6).

The results also disclosed that there are large differences between male and female engineers who are not working in an occupation related to their major field of training at UOT. The relative percentages are 57% and 81% respectively, as shown in Table 5-7. This is mainly because the female engineer, and may be many other female graduates, preferred jobs near their home town in order to live with their families, even if they could not find a job in their own field. This situation is due to the "social Iraqi-tradition" which still does not allow girls to live apart from their families, even after they graduate from university. Experience shows that Iraqi families are still opposed to any changes in this situation (Shukla, 1982). At the end of the seventies the government issued new regulations to change this tradition by asking all graduates, including females, to be willing, if there is real need for their specializations, to serve in other towns as a pre-condition for

Distribution of UOT Graduates by Province of Birth and Field of Present Job.

Table 5-6 (Percentage)

Field of Present Job		Province of Birth		Total
		Baghdad	Other cities	
1.	Major field of study	47	33	40
2.	Other fields	53	67	60
Total	(%)	100	100	100
	(No.)	(59)	(66)	(125)

UOT Graduates by Field olf Present Jobs and Gender.

Table 5-7 (Percentage)

Field of Present Job		Male	Female	Total
1.	Related field	43	19	40
2.	Unrelated field	57	81	60
Total	(%)	100	100	100
	(No.)	(109)	(16)	125

getting a job in the public sector. This policy failed and many female graduates stayed at home without any job, rather than accept a job in another town. This social factor was regarded as "very important or important" by the majority of females interviewed (13 out of 16), for their accepting unrelated jobs in their home town.

Surprisingly a high proportion of male graduates also regarded this reason as "important or very important", to be exact 57%. This could be the natural results of two factors: first, the differences in the facilities available in the major cities compared to those in small towns or in rural areas, such as transportation, post office, schools, shops...etc. Second, which in my point of view is even more important, traditionally there is a high degree of cohesion among the members of Iraqi families which requires them to live together. Thus male graduates still have little independence, even after they graduate from university or after they are married (Khadduri, 1978).

Another unexpected result is that all the brightest UOT graduates, in terms of university grades, are not working in occupations related to their major fields of study at UOT, see Table 5-8. Possible explanations for this phenomenon may be that there are attractive factors which encourage those engineers to accept jobs in unrelated occupations, such as getting promotion easier, better working conditions...etc. When we searched for such factors we found, for example, 32% of total UOT graduates in the sample, who are working in an occupation related to their field of study at UOT, getting promotion in their jobs compared with 43% of those who are not, as can be seen in Table 5-9.

UOT Graduates by Field of Present Jobs and University Grade

Table 5-8 (Percentage)

Field of Present Job		University Grade			Total
		Pass	Good	V.Good	
1.	Related Field	38	49	0	40
2.	Unrelated Field	62	51	100	60
	Total (%)	100	100	100	100
	(No.)	(77)	(43)	(5)	125

UOT Graduates by Field of Present Job and Promotion

Table 5-9 (Percentage)

Field of Present Job		Getting Promotion		Total
		Yes	No	
1.	Related Field	32	68	100
2.	Unrelated Field	43	57	100
	Total (%)	35	65	100
	(No.)	(44)	(81)	(125)

Hence, there are several factors influencing UOT graduates in their accepting unrelated jobs, such as obligation to work with government enterprises, the wish to live in their home town....etc. The relationship between those reasons and especially the effects of salaries in choosing related or unrelated jobs will be discussed in more detail in the next chapter, when we will concentrate on the income differences, job mobility, and the recruitment policies for UOT graduates.

5.5 TIME-USE AT WORK

The second criterion used in measuring the ineffective utilization or the under-utilization of UOT graduates was the distribution of their working time in their present job. Many researchers feel that time-use research is a more appropriate way of collecting information on the allocation of time to all major types of work activities, especially in developing countries where other statistics about unemployment, underemployment, supply and demand for HQM are scanty or inaccurate. (Szalai, 1972). This approach can also be useful for gaining a more realistic estimate of the actual work-schedules of certain professional groups like engineers, doctors, managers...etc., in societies whose cultural norms restrict the admittance to the labour market which seems to be the case for educated women in some Arab countries. Results from such research will provide further insight to the quality of utilization of HQM.

The major drawback is that it tends to be very expensive to collect and it takes a great deal of time. However, the results are likely to be subject to serious measurement and sampling errors because responses

will tend to be highly sensitive to such factors (Standing, 1978, 38). Most of these difficulties are practical ones and in spite of them, time-use studies can provide valuable information. For this reason, the current research trying to gain information about time-use by samples of UOT graduates in their present jobs in order to supplement our results about the ineffective utilization of engineering stock in Iraq. (Section 5.4). The author believes that this approach has some additional advantages in measuring the ineffective utilization of engineers in the Iraqi labour market for the following reasons:

1. The waiting period between graduation and employment usually represents a primary indicator of the capacity of the economy to absorb newly available labour, and specially the HQM. (Bikas, 1982, 155). This measure could not be used in Iraq because since 1978 all university graduates are directly employed after their graduation by public sector (as we shall see in Section 6-3). Hence there is no waiting period in this case.
2. Newly graduated engineers are usually employed as "assistant engineers" without any specification of the content of their actual work. So there is no indicator to differentiate different kinds of engineers between those who work in engineering fields and those who did not, by using the job title only.

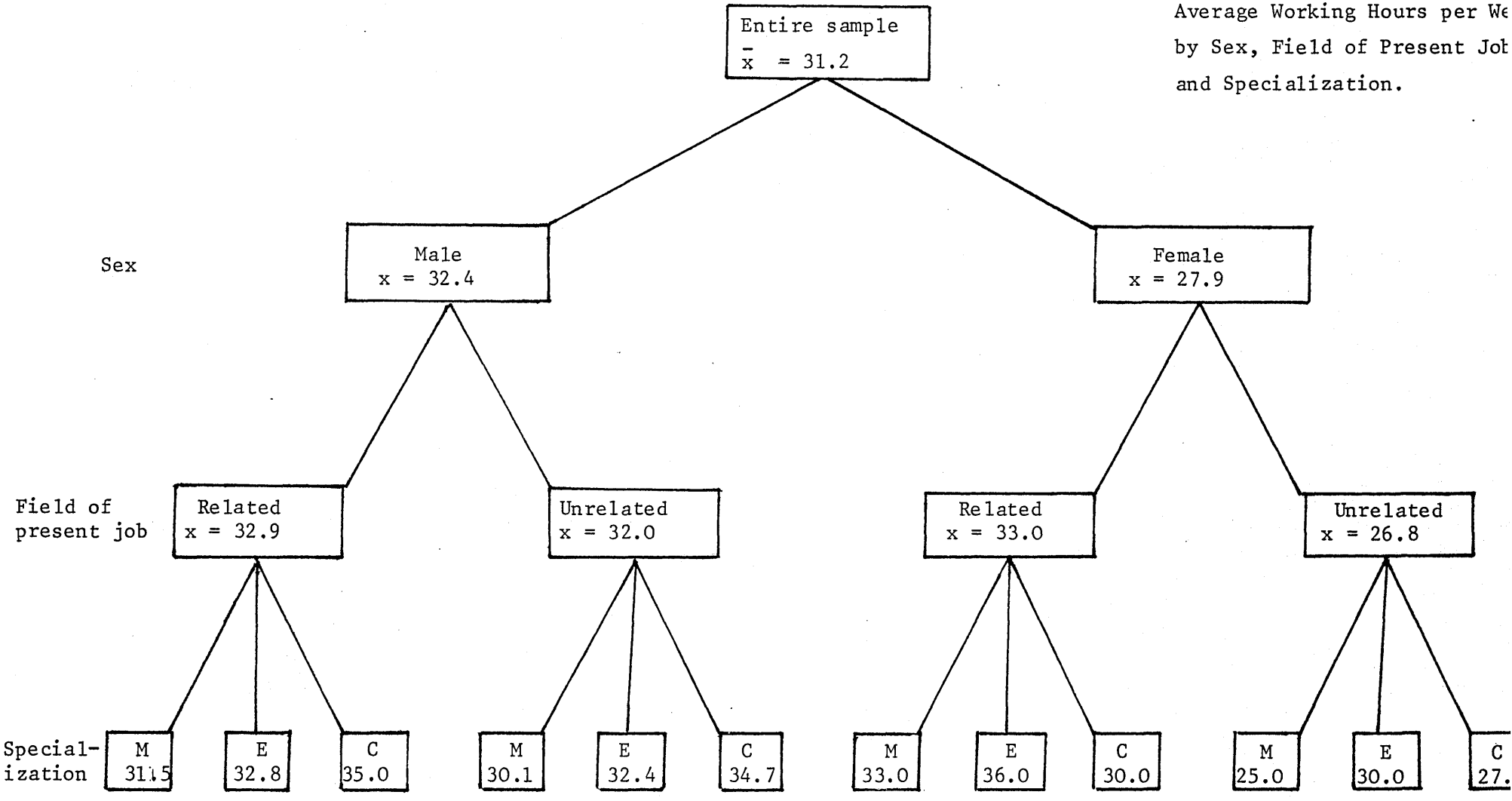
Accordingly, studying the distribution of actual working time among the major work activities could be used to indicate the actual utilization of the advanced engineering education at work.

In this section, most of the attention will focus chiefly upon the time used by UOT graduates during the official working hours at their current jobs, as estimated by them during the interviews (see Appendix 1, Question 27). Quite naturally, errors could occur in such sensitive areas, when some people have an incentive to over-estimate their time in order to upgrade the importance of their working tasks or the actual post they hold. The researcher was very aware of this problem and during the interviews he indirectly discussed any figure in detail to check on its accuracy.

The information reported is classified into five major sub-professional activities: engineering, administration, technical, private and other unclassified work. Most of the tables produced for current analysis of time-use by UOT sample graduates focused on both demographic characteristics (such as gender and specialization) and work characteristics (such as type of enterprise, job mobility, field of present job). Frequencies and breakdown analysis are used to display the differences among the main groups in the sample.

UOT graduates are working between 20-42 hours per week. The average for the entire sample is 31.2 hours, see Figure 5-6. The official working week is 35 hours. The actual average will be less if we excluded the time spent on private and social activities unrelated to their jobs, which is included in the above average. In the latter case the average will be decreased to 23.8 hours, which represents only two-thirds (68%) of official working hours. The total time spent on engineering work represented less than one-third of the total working time, as shown in Table 5-10. Too much time was devoted to the

Figure 5-6: Breakdown Analysis for the Average Working Hours per We by Sex, Field of Present Job and Specialization.



Specialization: M = Mechanical Engineers
E = Electrical Engineers
C = Civil Engineers

Average Working Hours Spent per Week by UOT Graduates on their Main Activities.

Table 5-10

Activities			Average hours per week	Total Hours	(%)
A.	Engineering Work	1. Applied Eng. 2. Eng. Research 3. Eng. Consultancy 4. Eng. Teaching	6.80 0.58 0.90 0.44		
	Sub total			8.72	28.8
B.	Administrative Work	1. Admin. Activities 2. Employee Supervision	4.98 1.39		
	Sub total			6.37	21.1
C.	Technical Work	1. Machine Maint. 2. Tech. Drawing	3.33 3.15		
	Sub total			6.48	21.4
D.	Private & Social activities	1. Private Studies 2. Newspaper Reading 3. Social Work 4. Private Interview	1.26 0.80 0.98 1.21		
	Sub total			4.25	14.1
E.	Other Activities	1. Job Interview 2. Preparing Computer Programme 3. Transportation 4. Chemical Analysis 5. Unclassified Activities	0.70 0.86 1.36 0.70 0.80		
	Sub total			4.42	14.6
	Grand Total			(*) 31.24	100.0

(*) Due to the rounding of the figures there is slight difference between the mean of total sample and the accumulated means of all the activities.

administrative, private and social activities, and about one-fifth of the total working hours spent in work which can be carried out by less qualified people such as technicians or skilled people. This may be a natural result of the acute shortage of technicians in the Iraqi labour market. According to the available data, the engineers/technicians ratio was 1-0.9 in 1980, (Al-Naimi, 1981, 8), while in developed countries it is supposedly to be 1-4 (Gerstte, 1975).

The shortage of technicians is not unique to Iraq. Some developed countries are also still suffering from this problem. In an early study in U.S.A. for example, it was suggested that some 34% of engineers' work, in terms of time allocated, could be undertaken by technicians. (Merrill, 1970). In the case of the U.K. it has been a common and long-standing complaint among engineers, that too much of their time is spent on mundane tasks, many of which could be allocated to technicians without any great productivity loss (Gerstte, 1975). The shortage of technicians thus has exacerbated the problem of under-utilization of professional engineers and the consequence is dissatisfaction among graduates placed in relatively low-level and routine work. On the other hand, it may exaggerate the apparent demand for engineers from employers in the public sector, which is the main employer for the new graduates.

In such analysis, using the mean in displaying the result cannot explain the main aspects of the problem when the variances around this mean are large and rounded between 20-42 hours. Hence, using other statistical measures could be more useful to clear some other aspects of the problem, such as the frequency distribution of engineers in the sample by types of activity and hours spent in each one. Table 5-11

Frequency Distribution of UOT Graduates by Number of Hours Spent on Different Activities in Their Present Jobs Per Week.

Table 5-11

Activities		Percentage (%)				
		0	1-6	7-12	12 +	Total
A	Applied Engineering	43	12	14	31	100
B	Engineering Research	90	7	2	1	100
C	Engineering Consultancy	85	11	4		100
D	Administrative Works	20	60	8	12	100
E	Private Interviews	62	38			100
F	Newspaper Reading	70	30			100
G	Private Studies	67	31	1	1	100
H	Employee Supervision	84	1		15	100
I	Technical Drawing	73	24	2	1	100

Distribution of UOT Graduates by Weekly Working Hours, Field of Present Job, Specialization, Gender, Changing Job and Relevance of Present Job to Their University Education.

Table 5-12 (percentages)

Factors	Working hours per week	
	Less than 35	35 or more
A. Field of Present Job:		
1. Industrial	77	23
2. Education & Research	45	55
3. Building & Construction	67	33
4. Civil Service Sector	83	17
5. Others	77	23
B. Specialization:		
1. Mechanical Engineering	88	12
2. Electrical Engineering	67	33
3. Civil Engineering	48	52
C. Gender:		
1. Male	68	32
2. Female	48	52
D. Changing Job:		
1. Yes	46	54
2. No	93	7
E. Relevance of present job:		
1. Related	70	
2. Unrelated	72	
Total Sample	71	29

shows that 43% of UOT graduates in the sample reported that they had never spent any time in applied engineering, 90% of them were not involved in any engineering research during the time of survey and 85% did not do any engineering consultancy. Meanwhile, 60% of the sample spent between 1-6 hours per week in administrative work and another 20% spent more than 6 hours per week in this type of work.

In our search for the reasons for the above differences, we have looked at five independent variables which might explain some of the reasons. These variables are: (1) field of present job, (2) educational specialization, (3) gender, (4) job mobility, and (5) relevance of present job to their university education. In order to disclose the possible effect for each variable we used crosstab analysis to find the influence of each variable in relevance to the total working hours. The summary of our search is shown in Table 5-12 and the main conclusions are:

1. The majority of engineers employed in the civil sector are working less than 35 hours per week compared with engineers working in the research and education sector. This may indirectly disclose the dissatisfaction of engineers who are working in the civil sector towards their jobs, due to the differences in income and other working conditions which will be discussed in some detail in Section 6-2.
2. A large proportion of female engineers are working less than 35 hours per week compared with male engineers. One possible explanation is that due to the majority of them (81%) are working in other or non-engineering fields, in contrast with 57% among male engineers.

3. Engineers who change from their first job since they graduated seem to work more than those who did not.
4. A high percentage of mechanical engineers are working less than 35 hours per week. This might be due to the large percentage of them working in other or non-engineering fields, which is 67% compared with 53% and 58% for electrical engineers and civil engineers respectively.
5. The proportion of those who are working more than 35 hours per week in the education and research sector is substantially higher compared with other sectors. This might be due to these people being teachers or researchers in technical institutes, members of several committees and in many cases teach many classes. However, it is not clear whether the working hours for those people (which is high) are based on the effective performance of their academic/intellectual functions, or whether it is an assessment deriving from time pressure as a result of their numerous engagements. Where the latter is the case, it is possible that the intellectual capabilities and academic expertise of such professionals are not being optimally utilized.

Taking into account the differences in the average hours per week spent in applied engineering which is supposed to be more relevant to activities in engineering specialties, as shown in Table 5-13, one can conclude the following results:

Distribution of UOT Graduates by Number of Hours Spent in Applied Engineering, Field of Present Job, Gender, Changing Job, and Relevance of Present Job to Their University Education.

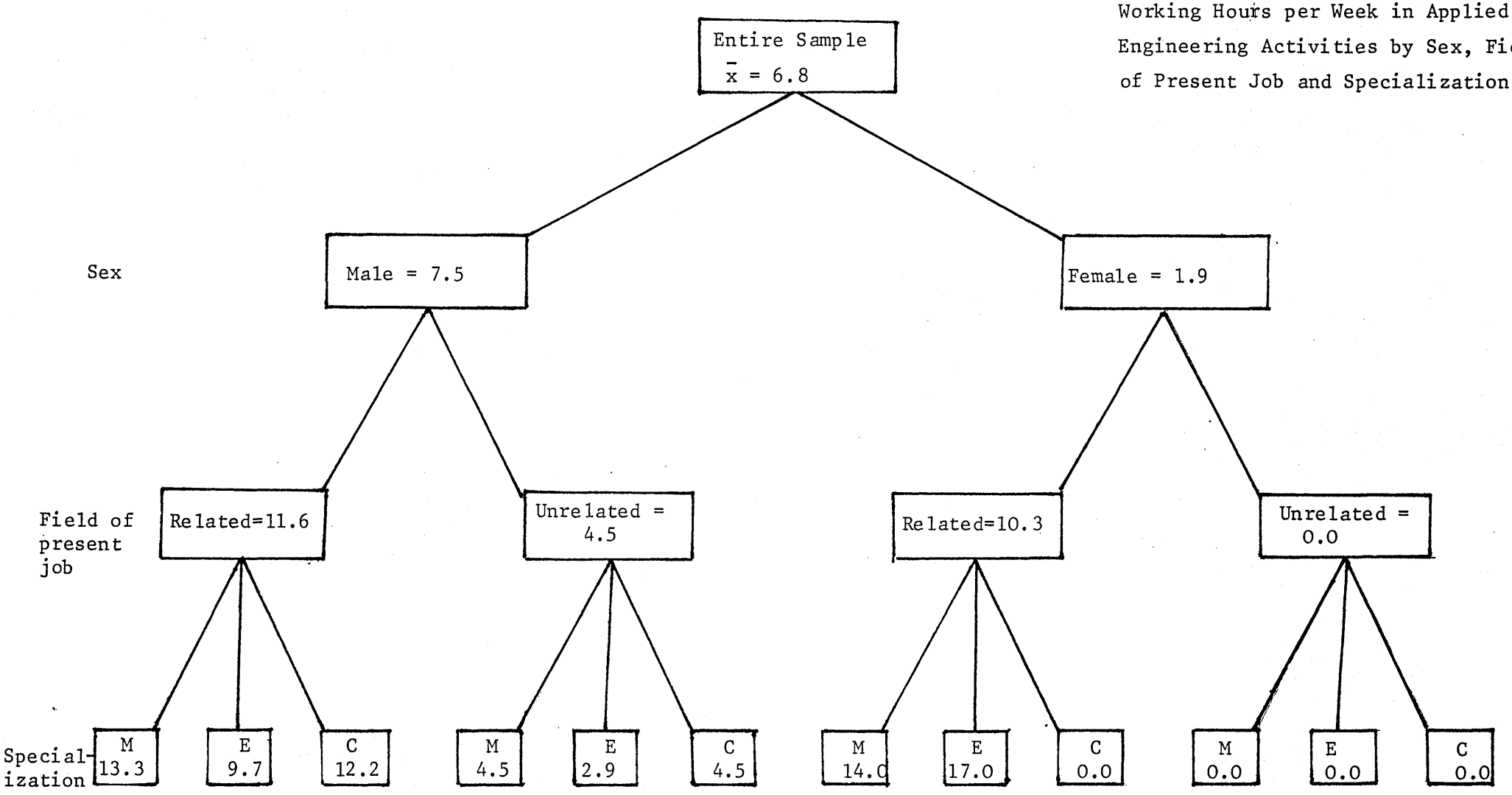
Table 5-13 (percentages)

Factors	Weekly Working Hours (%)		
	0	1-9	10+
A. Field of Present Job:			
1. Industrial	29	21	50
2. Education & Research	55	25	20
3. Building & Construction	14	10	76
4. Civil Service Sector	79	13	8
5. Other	42	16	42
B. Gender:			
1. Male	37	19	44
2. Female	88	0	12
C. Changing Job:			
1. Yes	37	49	14
2. No	62	31	7
D. Relevance of Present Job:			
1. Related	12	16	72
2. Unrelated	64	17	19
	43	17	40

1. There are significant differences in the proportion of engineers employed in the civil service sector, who do not work in applied engineering at all, compared with those employed in the building and construction sectors.
2. Male engineers generally devoted more hours than female engineers to activities connected with their university education (applied engineering). One important source of differentiation as we just mentioned, arises from the high proportion of female engineers working in jobs unrelated to their university education, as shown in Figure 5-7.
3. About two-thirds of our sample of engineers who were not working in their related field did not work in applied engineering at all, compared with only 12% of those who did.

These results are clear enough to suggest that the relevancy of present jobs to university education for UOT graduates is an important indication of the utilization of engineering education at work. Moreover, the wastage in advanced engineering in terms of the proportion of average hours spent in applied engineering activities and average working hours per week resulted from the ineffective utilization of present engineering stock, which was probably caused by a large proportion of them (60%) working in other or in non-engineering fields, especially among those employed in the civil service sector. This research makes it clear that this phenomenon is more obvious among female and mechanical engineers.

Figure 5-7: Breakdown Analysis for the Average Working Hours per Week in Applied Engineering Activities by Sex, Fiel of Present Job and Specialization.



Specialization : M = Mechanical Engineers
E = Electrical Engineers
C = Civil Engineers

5.6 SUMMARY

In measuring the effective utilization of current engineering stock in Iraq, two criteria were mainly used - the relevance of the respondents' present jobs to their university education and the allocation of working time among their main daily activities. The main results show that first, almost two-thirds of UOT graduates are working in fields other than what they were trained for. Second, about 70% of the engineers interviewed reported that they were working less than the official working hours of 35 per week, third, over two-fifths had spent no time at all in applied engineering work at their present jobs, fourth, on the average less than one-third of the total working hours of engineers are devoted to applied engineering work, while the administrative work and private activities acquired more than one-third of their actual working time.

Finally, the most important result is that about two-thirds of engineers who are working in jobs unrelated to their field of study, have never spent any time in applied engineering work. This is true for only 12% of those who are working in jobs relevant to their university education. This result suggests that there is a significant relation between the relevance of the present job and the utilization of university education. The above result reflects that both factors, relevance of present job to university education and utilization of university training, are simultaneously at work in the case of Iraqi engineers.

CHAPTER 6

ANNUAL INCOME, RECRUITMENT AND MOBILITY OF UOT GRADUATES

6.1 INTRODUCTION

The previous chapter on the distribution of UOT graduates among different jobs and the allocation of their daily working time showed that a high proportion of them are working in areas unrelated to their field of study at UOT, and that the majority of them spent little time on practical engineering activities. This chapter intends to examine some aspects of the working conditions of our sample, measure their present annual incomes and mobility, in order to disclose their effects on graduates' decisions to work in specific jobs and places, whether they were related or unrelated to their university specializations. Accordingly, the main topics in this chapter are:

First: The structure of present annual earnings and the main elements influencing the annual earnings of UOT graduates will be explained, using some statistical techniques to illustrate the main factors which affect graduates' annual income, and their influences on graduates' decisions to select their working enterprises and places.

Second: The recruitment policy for the UOT graduates will be discussed briefly, to explain the main factors influencing the flow of graduates to the Iraqi labour market.

Third: We shall discuss labour mobility of UOT graduates in order to determine the attitude of Iraqi graduates towards the above policy and its effect of their mobility.

6.2 ANNUAL INCOME OF UOT GRADUATES

Little attention has been paid to the influence of annual income on the distribution of Iraqi graduates among the economic sectors. Income is a particularly vexed issue among all Iraqi graduates, where as foreigners, or even Iraqi graduates working in the private sector, may earn between 3 to 5 times as much as those in the public sector. Nevertheless, there are vast differences in average earnings even among graduates working in different enterprises within the public sector itself. Thus, this section intends to examine, in general, the present earning structure of Iraqi graduates and compare it with some other developing countries. Then we will examine the main factors influencing the current annual income of UOT graduates.

6.2.1 The Earning Structure

The main purpose of this section is to give a brief account of the earning structure for the main groups graduated from higher education institutions in Iraq by level of education and specializations. In the public sector, for example, in which more than 90% of all higher education graduates are employed, the starting salaries of graduates and the expected increase in average annual income after five years at work are summarised in Table 6-1. It is worth noting that the salary of technicians is not only high relative to some other graduates' salaries, and relative to the number of years spent completing their courses, but they also increase quicker over time. What this means is that graduate technicians, even if they start slightly lower than other graduates, later in life their earnings grow quicker than all other university graduates. This is due to the government policy over the

Starting and Expected Salaries After Five Years for the Iraqi Graduates Working In the Public Sector.

Table 6-1

	Specialization	Length of study (years)	Starting salaries (I.D.)*	Expected salarie after five years (I.D.)	Increased %
1	Technicians	2	1050	1350	29%
2	Social Sciences and National Sciences Graduates	4	1070	1200	12%
3	Engineers	4	1300	1500	15%
4	Dentists and Architects	5	1400	1650	18%
5	Doctors	6	1550	1900	23%

* Iraqi Dinar is equivalent to approximately 2.5 pounds in 1985 at official rate of exchange.

* Figures in this table are in constant prices.

Source: Figures counted by the author according to the salary scheme in the "Civil Service Law" No. 64 of 1964.

last few years during which it has been trying to encourage more secondary school leavers to study in techhnical education rather than in arts or even in natural sciences, in order to solve the problem of the shortages of the technicians in the Iraqi labour market.

It is interesting to note that the starting salaries for Iraqi engineers are not only low compared to some other professions, but they also increase more slowly over time, social science and natural science graduates being the only exception. It is also clear that the main element determining the starting salaries for all Iraqi graduates is the number of years spent in higher education. This is obvious even among engineers themselves, when the starting salaries for architect engineers who spent five years in higher education is 8% higher than other engineers who spent four years in higher education.

The salaries for UOT and all other Iraqi graduates in general are relatively low compared with other skilled or semi-skilled labour. The plumber or bricklayer are, in most cases, paid three to four times as much as the engineer who supervises him. From data available, one can present further evidence on the movements in the earnings of engineers and other groups of labour for the period 1970-80. Part of this evidence is shown in Table 6-2. These figures revealed that in real terms the engineers' earnings fell during the last ten years.

The structure of engineering salaries compared with other groups of university graduates does not seem very different from some other developing countries, as shown in Table 6-3. The numbers in this table are indices having a base of 100, corresponding to the all subject

Comparison of Earnings of Engineers, Skilled and Unskilled Workers (1970-80). (In constant price).[a]

Table 6-2

Occupations	Average Annual Earning	
	1970	1980
Engineers (5 years experience)*	860	795
Skilled workers (5 years experience)*	675	4150
Unskilled workers (no experience)*	216	1650
Increase in engineers earnings (%)	100	92
Increase in skilled workers earnings (%)	100	615
Increase in unskilled workers earnings (%)	100	764

* Iraqi Dinar.

Source: Nyrop, Richard F., (1982), Iraq: A Country Study; Area Handbook Series, (American University, Washington D.C., Foreign Area Studies).

The University Graduates Earning Structure by Subject In Selecting Countries.

Table 6-3 (Percentage)

Country	All subjects (index base)	Engin-eering	Scien-ces	Medi-cine	Arts
Iraq	100	112	80	128	80
Tanzania	100	100	86	111	104
Malaysia	100	100	88	124	88
Iran	100	115	88	120	77
Zambia	100	93	99	96	112
Developing Countries (Average)	100	104	88	116	92

All figures, except Iraq's quoted from:

Psdacharopoulas, G., (1982), Higher Education In Developing Countries, A Cost-Benefit Analysis, (World Bank, World Bank Staff Working Paper No. 440, Washington).

average within a given country. In most cases, medicine and engineering graduates earn substantially more than other higher education graduates as a whole (Zambia being the only exception). The main question arising here is 'what are the main factors influencing the engineer's salaries in Iraq?' In the following section we will try to find the answer to this question.

6.2.2 Factors Influencing Engineers' Earnings

A number of aspects can be of interest in an attempt to explain differences in earning among UOT graduates. When examining the influences of several factors on the annual income in the present study two facts should be kept in mind:

First: Due to the lack of data, no comparison is made between UOT graduates and engineers who graduated from other engineering schools in Iraq.

Second: There are many variables which influence annual income, and the effect of these many variables are hopelessly confused unless some statistical techniques, such as regression analysis and breakdown techniques, are applied.

Thus the relationship seen in the tables presented in the following pages are only partly due to the variables indicated in the headings. They are also partly due to the combined effects of many other variables. Bearing these in mind, and from the data available throughout the current research, one can draw the following conclusions.

1. After four years in employment, the average annual income for UOT graduates was I.D 1426. This average reveals an increase of only 10% above the minimum starting salaries for Iraqi engineers which was I.D 1300. (See Figure 6-3).
2. About one-third of our sample have never received an increase in their salaries, when their annual income still stood at the minimum level of starting salaries, which is I.D 1300 (see the first shadow column in Figure 6-1). Meanwhile, the rest of the sample (two-thirds) got increases between 4%-40% above the minimum starting salary since they graduated.
3. The strongest influence on annual earnings is shown by the type of enterprise. This influence can be seen in Figure 6-2. On average, engineers who are working in quasi-government enterprises, earn 16% more than those who are working in public enterprises four years after graduating.
4. Many of the differences could also be explained by the economic sectors of the enterprise. Engineers working in the industrial sector earn 14% more than those who work in the civil service. (See Figure 6-2).
5. Another influence on present annual income is shown by mobility in work. UOT graduates who did change their first jobs earn 10% more than those who did not, as shown in Figure 6-2.
6. Surprisingly, those who are working in jobs unrelated to their university education are, on average, earning 4% more than those who are working in related jobs. These differences are more evident in public enterprises than in quasi-government enterprises, and rounded between 4% in the first and less than 0.3% in the second. (See Figure 6-3).

Figure 6-1: Distribution of UOT Graduates by First Annual Income and Present Annual Income.

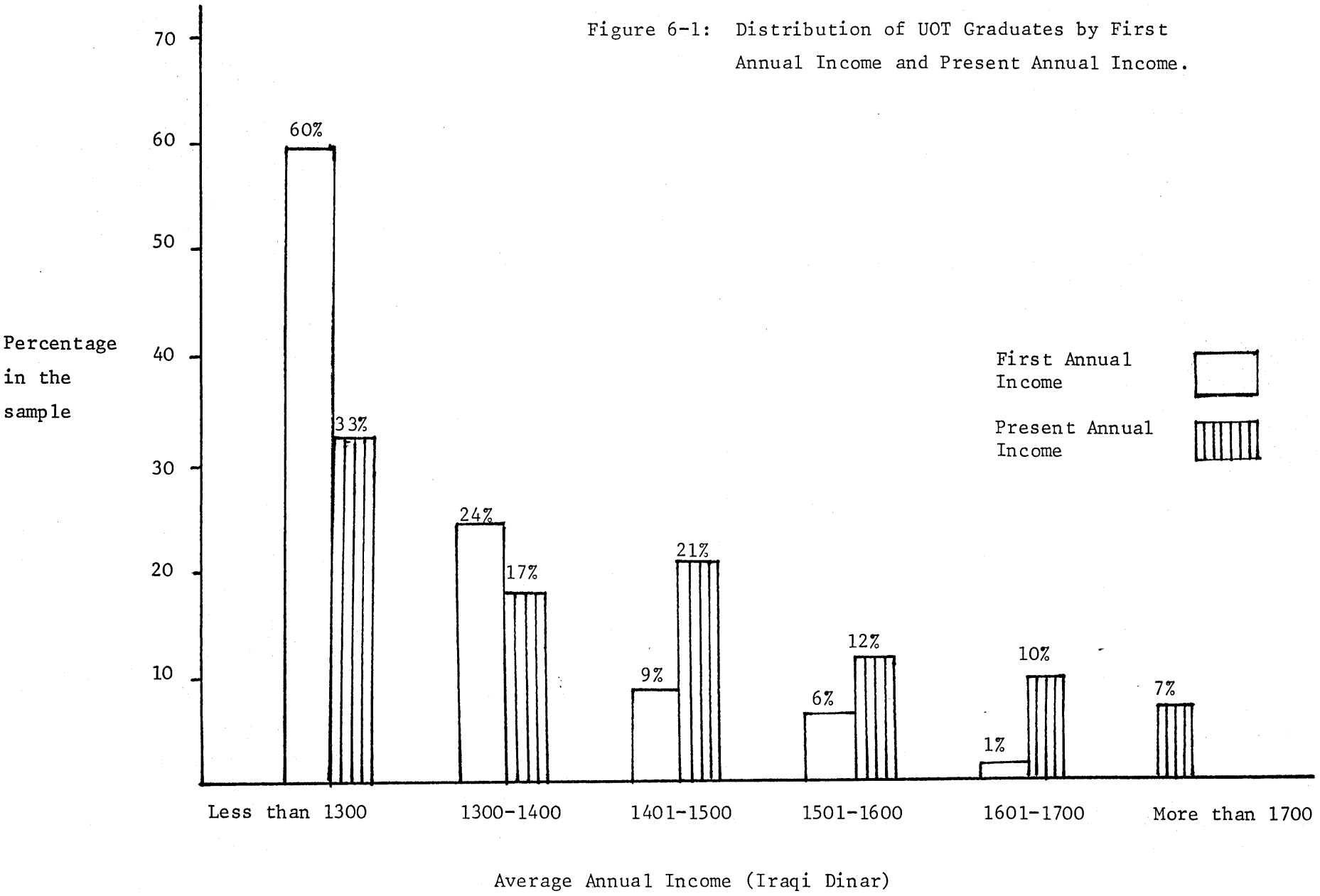


Figure 6-2: Differences in Average Annual Income Among UOT Graduates' Sample.

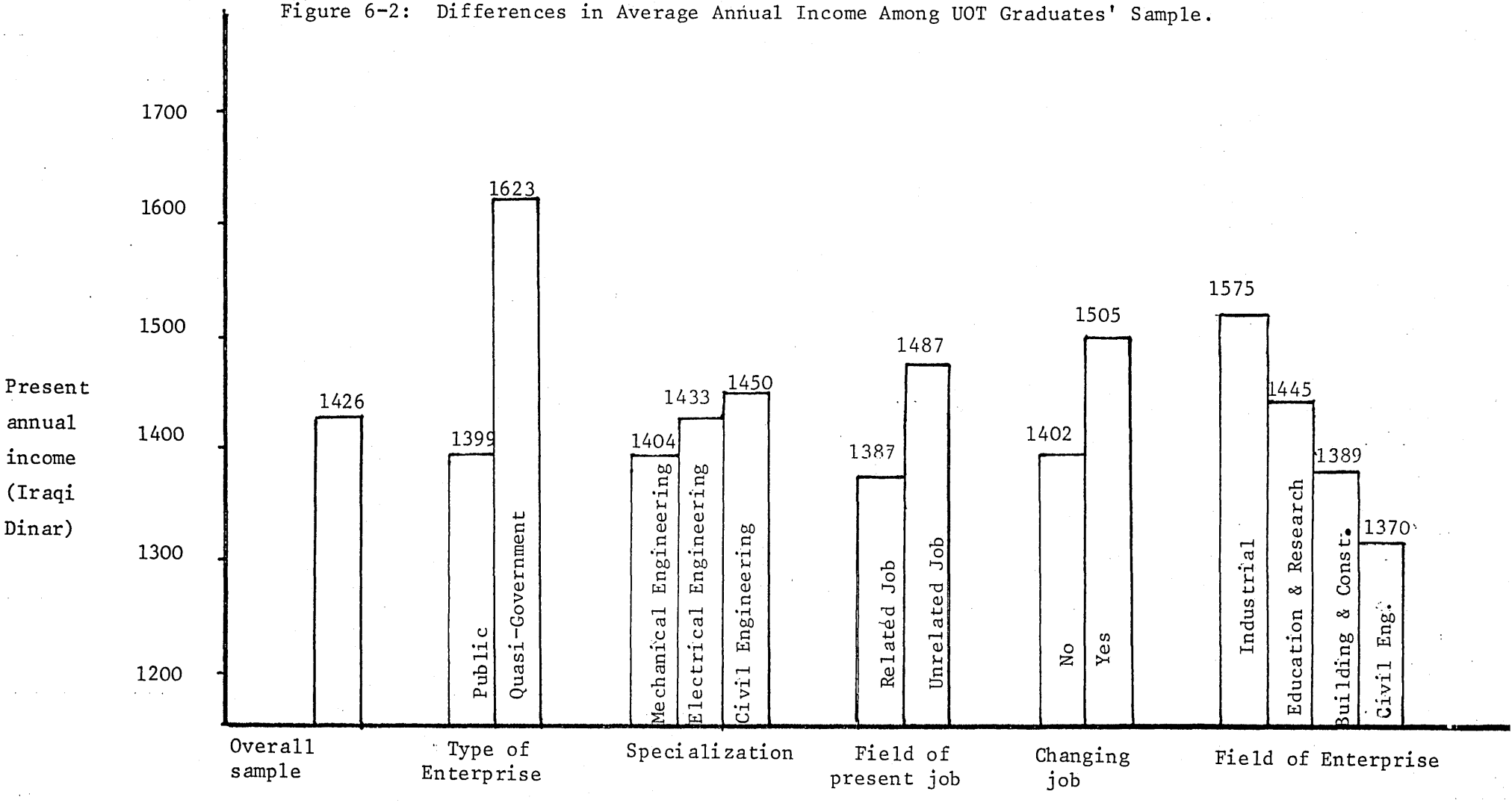
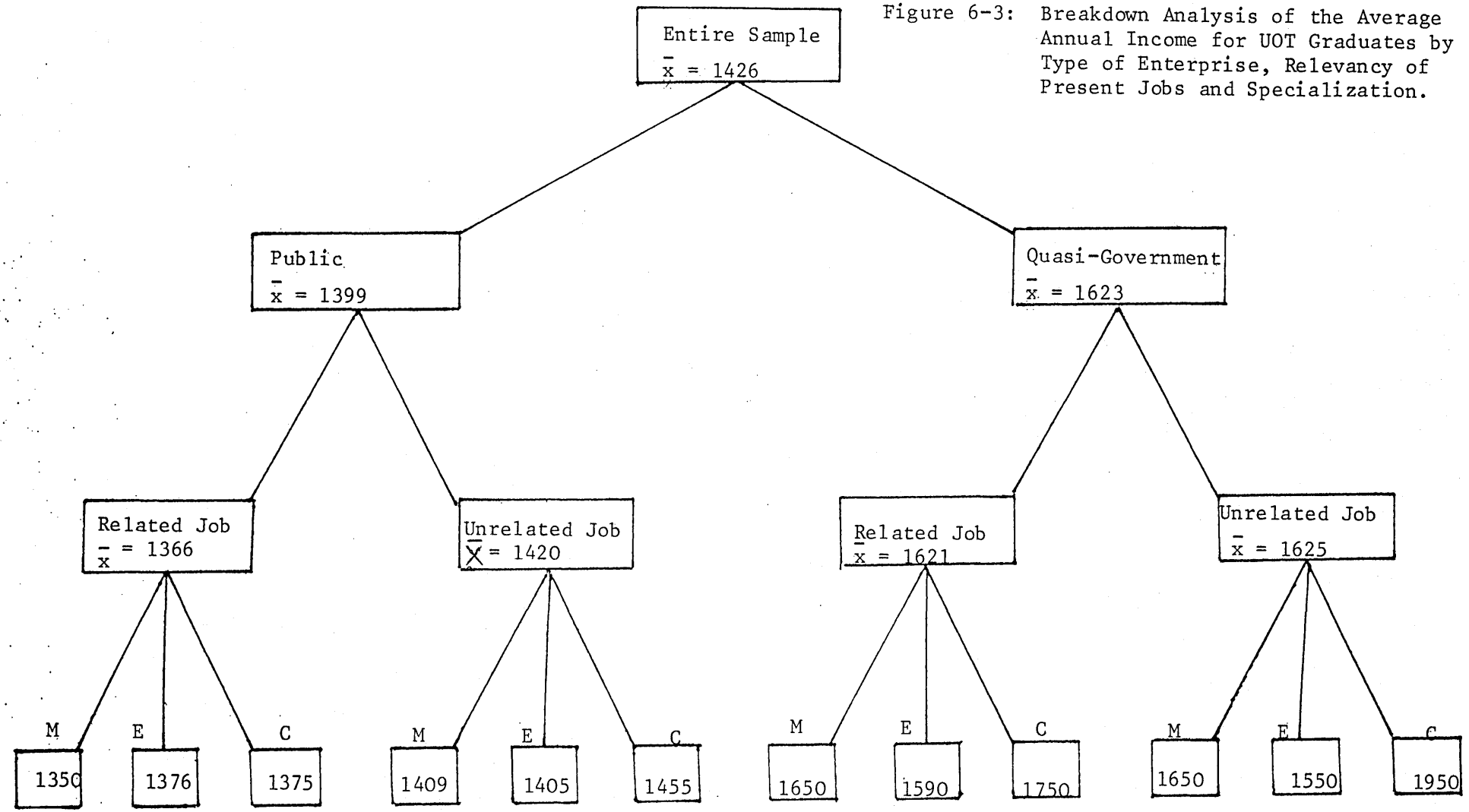


Figure 6-3: Breakdown Analysis of the Average Annual Income for UOT Graduates by Type of Enterprise, Relevancy of Present Jobs and Specialization.



Specialization: M = Mechanical Engineers
E = Electrical Engineers
C = Civil Engineers

7. Gender has not had the effect that one would have expected. Female engineers in our sample receive on average about 2% more than male engineers. The only explanation in this case is that these differences are not due to gender, but largely to the type of enterprise (when about 40% of female engineers are working in quasi-government enterprises) or economic sectors in which they are working (another 32% of female engineers are working in the industrial sector) or any other factors.

6.3 BREAKDOWN ANALYSIS OF THE DETERMINANTS OF EARNING

The simple relationships between earning and various possible factors were described above. These relationships are simple in the sense that they are not contaminated by the influences of many other variables. It was found above, for example, that engineers who are working in public enterprises earn markedly lower annual incomes than those in quasi-government enterprises. A part of this observed difference should be attributed not to the type of enterprise (public or quasi-government), but to other factors such as specialization, university grades, economic sector of the firm, and socio-economic background, such as parents' educational level.....etc. In order to determine the factors which have significant effects on the earnings of UOT, it is necessary to use some statistical techniques. Breakdown analysis is most commonly used for this purpose for the following reasons:

1. The utility of this analysis is substantial when some independent variables are nominal, ordinal, or interval as long as they are classified into a limited number of discrete groups, as it is in the present research.

2. It is allows the researcher to statistically test whether the means of subsamples into which the sample data are broken are significantly different from each other, i.e. the researcher is testing the null hypothesis where there are real differences in the present annual income between UOT graduates. The null hypothesis will be rejected when it is less than 0.05 level of significance.

3. It enables the researcher to attach an actual dinar average to the present annual income of UOT graduates in each group.

In the data set, almost all factors commonly identified as being relevant in explaining variations in annual earnings are presented. The breakdown analysis for the purpose of this study was carried out in three groups. In the first group the variables related to socio-economic background were entered into the equation. Those variables are:

A. Place of birth (Q5C)
B. Fathers' educational level (Q7A)
C. Mothers' educational level (Q7B)
D. Fathers' occupation (Q8A)
E. Mothers' occupation (Q8B)

In the second group some personal characteristics are examined in order to find their influence on annual income for UOT graduates. The relevant variables are:

A. Gender (Q3A)

B. Specialization (Q2)

C. Secondary school points (Q9)

D. University grades (Q12)

Finally, in the third group variables related to working conditions in the present jobs were entered in the equation. Those are:

A. Working hours per week (Total, Q27)

B. Field of present enterprise (Industrial, Educational...etc., Q1A)

C. Type of enterprise (public, quasi-government Q1B)

D. Relevance of present job to university specialization (Q18)

E. Changing job (Q22A)

F. First annual income (Q23)

G. Promotion (Q24A)

All these factors can be hypothesized to influence present annual income of UOT graduates interviewed. Since the years of education and experience are the same in the sample, the major effects, according to the human capital theory should be shown by specialization, socio-economic background and type of enterprise. (Becker, 1964).

All variables listed above were entered into the breakdown equation. The summary of the results are seen in Table 6-4. As we mentioned above, we will accept the null hypothesis at 0.05 level of

significance or more and reject the null hypothesis when the 0.05 level of significance can not be achieved. As can be seen in Table 6-4, the null hypothesis accepted for all the variables related to socio-economic background, i.e. there is no significant variance in annual income for UOT graduates according to their place of birth, fathers' educational level, mothers' educational level, fathers' occupation, and mothers' occupation. One can conclude that the Iraqi society has achieved the social equity through the eradication of social discrimination in the labour market.

Examining the effect of some personal characteristics on annual income indicates that there is no significant influence, and the null hypotheses accepted for all the four variables related to personal characteristics. The only indication is that the specialization has some little effect, that is due to the annual income for civil engineers which is slightly higher than other specializations, not because their salaries are higher but because of the type of enterprises or other variables.

The third set of variables related to the factors at the labour market. The null hypothesis for all variables are rejected, i.e. all seven variables seemed to have a significant influence on the present annual income for UOT graduates. The variables highly influencing the present annual income are the first annual income, type of enterprise, field of enterprise and promotions. Some other results indicated that those engineers who are working in related jobs received on average I.D. 100 less than those who are working in unrelated jobs. This result might explain why a high proportion of UOT graduates are seeking jobs in areas unrelated to their university education.

Influence of Selected Factors on Annual Income

for UOT Graduates.

Table 6-4 A. Socio-economic Factors (n = 125)

Factors	Means	Variance in means	Signif-icance	Testing the null hypoth-ethsis
A. Place of Birth				
1. Baghdad	1414	20	0.77	Accepted
2. Mosul, Basrah and Tamem	1439			
3. Other cities	1434			
B. Father's Educational Level				
1. Less than secondary educ.	1433	12	0.72	Accepted
2. Secondary & higher educ.	1421			
C. Mother's Educational Level				
1. Less than secondary educ.	1428	4	0.90	Accepted
2. Secondary & higher educ.	1424			
D. Father's Occupation				
1. Unskilled & farmers	1458	76	0.15	Accepted
2. Semi-skilled & skilled	1382			
3. Government employees	1384			
4. Professionals	1454			
E. Mother's Occupation				
1. Semi-skilled & skilled	1425	60	0.53	Accepted
2. Government employees	1450			
3. Professionals	1390			
4. Housewives	1438			

Note: For the entire sample the mean = 1426

Influence of Selected Factors on Annual Income

for UOT Graduates.

Table 6-4 B. Personal Characteristics Factors (n = 125)

Factors	Means	Variance in means	Signif-icance	Testing the null hypoth-ethsis
A. Gender				
1. Male	1426	1	0.98	Accepted
2. Female	1425			
B. Specialization				
1. Mechanical Engineering	1404	46	0.48	Accepted
2. Electrical Engineering	1433			
3. Civil Engineering	1450			
C. Secondary School Scores				
1. Less than 80 points	1433	19	0.54	Accepted
2. 80-90 points	1414			
D. University Grade				
1. Pass	1417	33	0.78	Accepted
2. Good	1438			
3. Very Good	1450			

Note: For the entire sample the mean = 1426

Influence of Selected Factors on Annual Income

for UOT Graduates.

Table 6-4 C. The Labour Market Factors (n = 125)

Factors	Means	Variance in means	Significance	Testing the null hypothesis
A. Field of Enterprise				
Industrial & Mining	1523	203	0.00	Rejected
Education & Research	1445			
Building & Construction	1389			
Civil Service Office	1320			
B. Relevance of Present Job				
Related	1387	100	0.00	Rejected
Unrelated	1487			
C. Changing Job				
Yes	1402	103	0.00	Rejected
No	1503			
D. Getting Promotion				
Yes	1563	217	0.00	Rejected
No	1351			
E. Type of Enterprise				
Public	1399	224	0.00	Rejected
Quasi-Government	1623			
F. Total Working Hours				
Less than 35 hours per week	1388	131	0.00	Rejected
35 hours or more per week	1518			
G. First Annual Income				
1250 - 1349	1322	578	0.00	Rejected
1350 - 1449	1496			
1450 - 1549	1659			
1550 - 1649	1735			
1650 - 1749	1900			

Note: For the entire sample the mean = 1426

Summing up one can conclude the following findings:

1. The socio-economic factors have no significant influence on determining the annual income of UOT graduates. This is an indication that the Iraq society has achieved the social equity through the eradication of social discrimination in the labour market, at least for highly qualified people.

2. Personal characteristics of respondents have no significant influence on determining the annual income, though they are supposed to have a very important factor effect on the productivity of engineers and other highly qualified people.

3. The above result indicates that there is no sex discrimination in the labour market for engineers, which reveals another aspect of social-equity in the Iraqi society.

4. Factors at the labour market represent the dominated factors influencing the present annual income for the UOT graduates.

6.3 RECRUITMENT POLICY FOR UOT GRADUATES

During the last two decades the recruitment policies for the Iraqi graduates have shown a considerable fluctuation in both their aims and tools. However, a close link between those policies and the economic fluctuations are very clear during this period. In the mid 1960s a

rapid expansion in the number of enrolments in higher education institutions took place. As a result of that, a large number of those enrolments graduated and applied for jobs in the public sector. At that time the economic recession in Iraq was obvious, due to the decrease of oil exports, and the delaying of the achievement of many industrial projects. The government was facing a problem in finding relevant jobs for most of them.

According to the official report, there were more than 6000 unemployed among university graduates in 1973 who represented about one-third of the total university graduates during the period, 1969-1973 (Section 2-8). Some of them were searching for jobs for more than three years. The government had to intervene in order to avoid massive unemployment among university graduates. The increase in government revenues from oil helped her to issue a law in which jobs were guaranteed to all university graduates. The government took the decision to recruit all unemployed graduates; this forced her to expand the number of non-productive jobs in the service sector and government administration to absorb those graduates.

After nationalization of oil wealth in 1972, and the increase of oil prices in 1973, the government revenues increased eleven-fold within five years. It was increased from I.D 570 million in 1970 to I.D 6350 million in 1975, in constant prices (E.I.U. 1980, 39). A large proportion of these revenues are invested in economic projects. Thus the demand for all kinds of manpower, and especially the highly qualified manpower, has increased. The total supply of qualified people lagged behind. The government with the national interests, and in order

to secure the implementation of the national development plan for the years 1976-80, asked all university graduates to work in public sectors, where there is an actual need for their talents. Since then, the state has become the only employer for all university graduates.

One major criticism for such a policy is that it did not accompany redistribution of the highly qualified people from one sector, in which they are underemployed and overstaffed, to another where there is a real need for their talent. Instead of that many government regulations were issued to put a restriction on any shift among university graduates from sectors where the underdeployment of those people was very clear, especially in the services sector.

The execution of the present recruitment policy for university graduates is committed to the "Graduates' Placement Committee" located in the "Ministry of Planning". The recruitment process generally comprises three phases:

1. The graduates make their selections among the vacancies announced by the "Graduates' Placement Committee" which are usually restricted to six choices. These choices are also restricted to the name of the ministry(ies) the graduates wish to work in rather than the name of a particular enterprise or place of work.
2. The Committee selects the place of work (the name of the ministry only) which may not be chosen by the graduates. The Committee selection is based on the demand of each ministry for graduates.
3. The graduates are finally appointed to their final enterprises by the "Personnel Department" in each ministry, and are required to accept this appointment.

Although the labour market for highly qualified people in Iraq seems rigid, and the possibilities of switching from one to another seem restricted, the restrictions on changing one job are actually less than they seem. This is due to a high proportion of the UOT sample graduates actually changing their jobs during the first two years after their graduation, as we shall see in the next section.

In explaining some reasons behind the changing of jobs by a high proportion of the UOT, one must take a close look at the relationship between the engineering education system and the labour market for engineers. This relationship is far too simple to provide the basis for a satisfactory description for the problem of satisfying the needs for both the UOT graduates and their employers. It needs to consider the views of both sides in addition to other economic, social, and political factors. However some available information can serve as a general framework of discussing the main reasons for changing jobs and using them as guidelines in forming the new policies in graduate recruitment which will be explained in the following section.

6.4 MOBILITY OF UOT GRADUATES

Two aspects will be considered in our discussion of the mobility for UOT sample graduates - regional mobility and job mobility.

Regional, or geographical mobility may result from government action to allocate engineers among the provinces. Sometimes government action may reflect the individual's preferences to relocate, to further career objectives, or to work in more desirable geographical areas. Due to the social factors dominant in Iraqi society, the latter type of

mobility (individual preferences to work in a more desirable area) could be more likely than the first one. To prove this, the UOT sample graduates were asked whether they changed their first job or not, when they did it, and why they did it (Questions 22a, 22b and 22c). Two main findings can be shown from the data obtained in this study about regional mobility:

First: There is a regional mobility among the UOT graduates from small provinces to the large ones, especially the capital - Baghdad. Small provinces had lost about two-thirds of UOT graduates who originated from those provinces and are now working in the large cities. (See Table 6-5A).

Second: More than one-fifth (or to be exact 22%) of the sample indicated that they worked in a different region from the one in which they originated. It was counted from the total numbers out of the shadow boxes in Table 6-5B. (A recent study from Egypt found that such a proportion was only 13% among university graduates, which is about half of our proportion - see Sanyal, 1982, p.185). Moreover, the differences in this proportion among the UOT sample graduates originated from different provinces are very large, i.e. the percentage of those who originated from Bahdad and work in other provinces was only 3% while those who originated from provinces other than Baghdad, Mosul, Basrah and Tamem and work in the large cities was 66%. Baghdad alone attracted more than half (53%) of UOT graduates, whose places of birth and work are difference, and 43% of them were attracted to the other three main cities, Mosul, Basrah and Tamem.

Regional Mobility of UOT Graduates by

Provinces of Birth and Work.

Table 6-5A (Percentage)

	Provinces	Provinces of birth	Provinces of work
1	Baghdad	47	58
2	Mosul, Basrah & Tamem	23	31
3	Other provinces	30	11
	Total	100	100

Distribution of UOT Graduates by

Provinces of Birth and Work.

Table 6-5B

Province of Work	Province of Birth			
	Baghdad (No)(%)	Mosul, Basrah & Tamem (No)(%)	Other provinces (No)(%)	Total (No)(%)
Baghdad	57 (79)	1 (1)	14 (20)	72 (58)
Mosul, Basrah and Tamem	1 (3)	27 (69)	11 (28)	39 (31)
Other provinces	1 (7)	0 (0)	13 (93)	14 (11)
Total	59 (47)	28 (23)	38 (30)	125 (100)

Obviously these results show that the geographical mobility of Iraqi engineers has not followed patterns of general population, as it is in some developed countries like U.S.A. (Dael, 1975, p.159), when 89% of engineers in the sample worked in four provinces which have a total population of only 48%. The other fourteen provinces have only 11% of engineers while their population is 52% of total Iraqi population. This regional mobility seems to be of a sufficient magnitude that it may represent a kind of "internal brain-drain".

The attraction of the large cities, and especially Baghdad, is not restricted among UOT graduates only. Similar findings were found in the distribution of other professional groups. Depending on the latest data available about the distribution of doctors, practitioners, dentists, and pharmacists (see Table 6-6) demonstrated that although the differences between the distribution of those professionals and the population is less than the differences among our sample (see Table 6-5A), the imbalance, however, is still substantial.

This phenomenon is probably dependent on two sets of factors:

First: The social factors in Iraqi society which induce most professional people to work in Baghdad and in other leading provinces rather than in their own provinces which lack the main modern facilities for those kind of people, like modern houses, schools, shops, clubs....etc.

Second: The national distribution of the industrial enterprises which represent the main employer of UOT graduates, and other highly qualified people, might be located in the large provinces. However, this might not be the case in our sample when most of

Distribution of Population and Medical

Professionals in Iraq by Provinces (1980).

Table 6-6 (Percentage)

Province		Doct-ors	Prac-tion-ers	Dent-ists	Phar-mac-ists	Total	Popu-lation
1.	Baghdad	57	41	40	52	48	26
2.	Mosul, Basrah and Tamem	14	20	17	15	18	22
3.	Other provinces	29	39	43	33	34	52
Total		100	100	100	100	100	100

Source: Ministry of Planning (1980), Annual Abstract of Statistics, 1980, (Central Statistical Organization, Baghdad).

those who changed their first job are still working in unrelated jobs, as we shall see in the next section.

Another kind of mobility is job mobility. The results of our searching in this study revealed that more than three out of four (or 77%) of UOT graduates in our sample have changed their jobs since their first placement after graduation in 1980. 83% of these changes occurred during the first year, and the remainder (17%) during the second year. Job mobility among males is higher than among females, as shown in Table 6-7. The proportion of engineers who changed their first job is very high in all economic sectors, though lower in education and research (50%) compared to the industrial sector (77%) and in the building and construction sector (86%); for details see Table 6-8.

The high percentage of job mobility among UOT sample graduates could be partly due to the over-supply of engineers to some public enterprises, resulting from the over-estimation of their requirements by the Planning Ministry or the estimation made by the authorities in the relevant ministries. When the new engineers arrive they have no job to do, then they have a strong incentive to move to another firm.

Another possible reason for job mobility may be the central recruitment policy which usually chooses many graduates in places or with employers that conflict with their preference, especially if those places are far away from their home town. Hence, they try to change their jobs as soon as they can.

Distribution of UOT Sample Graduates By Changing Job within 2 Years of Graduation, and Sex.

Table 6-7

Sex		Changed Job		Total
		Yes	No	
Male	(No.)	88	21	109
	(%)	(81)	(19)	(87)
Female	(No.)	8	8	
	(%)	(50)	(50)	(13)
Total	(No.)	96	29	125
	(%)	(77)	(27)	(100)

Percentage of UOT Sample Graduates Who Changed Their First Job By Economic Sectors.

Table 6-8

	Economic Sector	Percentage of those who changed their job
1	Industrial	77%
2	Education & Research	50%
3	Building & Construction	86%
4	Civil Services	79%
5	Others	89%
	Total	77%

Clearly both kinds of mobility represent instability in jobs for the new engineers in a period supposed to be devoted to acquiring practical experience for the new engineers. This might lead to a wastage in engineering knowledge and time for new engineers, particularly when those engineers move to jobs unrelated to their university education, as was the case of a substantial proportion of UOT graduates in our sample. One interesting question arises here - what are the main reasons which induced those graduates, and may be other university graduates in Iraq, to change their first jobs as perceived by the graduates themselves?

Engineers in the sample who had changed their jobs were asked to indicate their reason(s). The most important reason given was "the present job is in my home town", which was regarded as a first or second reason by more than half of those who had changed their first jobs (see Table 6-9). Another important reason was "the present job is more relevant to my university education". This was regarded as a first or second important reason for changing jobs by more than one-third of the engineers in the sample who had changed their jobs, which means that the first jobs (usually chosen by the Graduates' Placement Committee) had no connection with their university specializations. Nevertheless, 59% of engineers who had changed their jobs are still working in jobs unrelated to their university training. This suggested that other reasons might influence the graduates' preferences of their work places. In this sense, economic factors, in terms of high salary, seem to have a considerable influence on changing jobs. It was regarded as a first or second important reason by more than one-quarter (27%) of the engineers who had changed their first jobs (see Table 6-9).

Reasons for Changing Job as Perceived by UOT Sample Graduates (According to the degree of importance).

Table 6-9 (Percentage)

	Reasons	Degree of Importance		Total (%)
		First (%)	Second (%)	
1	Present job in my home town	31	27	58
2	More relevance to my university training	18	19	37
3	High salary	15	12	27
4	Social prestige	8	8	16
5	Better chance for further education	10	5	15
6	Better experience	5	8	13
7	More independence	6	6	12
8	Better career	4	4	8
9	Better working conditions	3	5	8
	No answer	0	6	
	Total	100	100	

Total Respondents (N) were = 96

In summary, job mobility among UOT graduates was very high. 77% of the sample changed their first job since they graduated in 1980. The most important reason for changing jobs by UOT graduates is the social factor, in terms of willing to work in the leading cities. For graduates, Baghdad is the city of their choice. Meanwhile, the relevance of the present job to their university education, and the economic factor, in terms of high salary, are also important.

Two major conclusions about the present job mobility among UOT graduates can be summarised.

First: There is a high proportion of wastage in educational specialties, since about two-thirds of engineers who changed their jobs are still working in jobs unrelated to their university education.

Second: The present recruitment policy for the graduates managed by the Ministry of Planning needs to be reviewed in the light of the real needs of economic enterprises and graduates' preferences. this balance could be achieved by creating a new incentive structure to guide new graduates to prospective employers, and where their specializations are needed.

6.5 SUMMARY

This chapter was intended to explain the main reasons which induced the UOT graduates to work in jobs unrelated to their university education. Our investigations revealed that the salary of UOT graduates and of most other Iraqi graduates in general, are at present relatively low, compared with the semi-skilled or skilled labour. Even though about one-third of our sample have never received any increase in their salaries over the last four years since they graduated. Many factors have shown their influences on the annual earnings, such as mobility in work, type of enterprise and economic sectors of the enterprises....etc.

Another result shows that there is considerable differences in the annual earnings of the UOT graduates in our sample. Researching the main factors these differences show that the socio-economic factors (place of birth, fathers' and mothers' education...etc.) and personal characteristics, have no significant influence on determining the annual income, while the factors relating to the labour market have a significant influence on the average annual income for the UOT graduates.

The results shown in this chapter revealed that the mobility at work among UOT graduates was high, and the present recruitment policy for university graduates, in general, need to be closely looked at if the goal of a close link between higher education institutions and productive systems might be achieved. This could help to satisfy both the need of the economic sectors for highly qualified people, and the individual need, in terms of working in the jobs and places they wanted.

In this sense, the researcher believes that it is very important for the government to introduce a new monetary incentive system which can play a major role in encouraging the new graduates to work in firms that badly need their talents and satisfy as precisely as possible the requirements of the productive system and graduates needs, rather than to just allocate them by the "Graduates' Placement Committee" and after a short time one can find a large number of them working in other firms or places which in many cases are far away from their preferences or specializations.

CHAPTER 7

THE QUALITY OF UOT GRADUATES

7.1 INTRODUCTION

As we pointed out in Chapter 5, the problem of the current shortage of engineers in Iraq might be caused by two main factors. First, the under-utilization of the present engineering stock, which was thoroughly discussed in Chapter 5. It was confirmed that the UOT graduates in our sample are under-utilized in terms of the proportion of those who are working in jobs other than their specialization (which is about three-fifths of the total sample) and in terms of the proportion of their working time spent in applied engineering activities (when two-fifths of the sample have never spent any time in applied engineering). Second, another possible factor might be the low standard of UOT graduates, which led them to accept any other job rather than the relevant one, or poor performance, even if the job is relevant, which led to employing two or three engineers in jobs supposed to be carried out by one engineer.

Let us take a look at the claim that "the quality and not the quantity is the problem." Incidentally, the same claim has been repeated many times by politicians, employers and many university staff involved in planning the future needs for qualified manpower, often with reference to graduates in general rather than just to engineers. To convey the flavour of the situation we will satisfy ourselves with the following quotation from the "Report of the Eighth Conference of the Ba'th Party in 1974":-

> "Each year universities produce thousands of students whose training cannot be effectively used in industrial or agricultural projects or in those of the expanding public services. The government has to find employment for them in organizations which are already overstaffed, where they in fact add to the pool of disguised unemployment....The new

> stage demands radical reform of the universities, which must cease to be traditional centres for the distribution of diplomas and become centres responsible for building a new generation, centres for scientific research and planning for the future". (The 1968 Revolution, 1979, 114).

In spite of the efforts devoted since the above comments were cited in 1974, progress in raising the quality of graduates has been slight, given the resources provided and the efforts expanded in this cause. This is clear when the Central Report of the Nineth Congress of the Arab Ba'th Party attributed low productivity in most public enterprises to the low standard of technical and highly qualified people working in those firms. (The Central Report, 1982, 130).

Hence, this chapter will be devoted to examining the quality of UOT graduates in order to determine its influence on the performance of graduates, which might explain some of the reasons for the present shortage of engineers. As every specialist knows, researching such a problem is not an easy task, due to unquantitative aspects of the main variables influenced, and in the absence of acceptable criteria, which could lead to the objective judgements.

With these limitations in mind we will concentrate on three main elements influencing the quality of UOT graduates - staff, students and administration. The availability of the data about these elements is the only criterion used in selecting those elements. In this chapter we will investigate two elements of the teaching process at UOT, staff and students. While the third element, which is the influence of the administrative structure and processes will be discussed in Chapter 8. Before one can do that, a brief review of the relevant literature about the quality of graduates will be discussed in the next section.

7.2 MEASURING THE QUALITY OF GRADUATES

Measuring the quality of graduates is not in itself easily measured. We have no acceptable yardsticks to document our concern. This is due to the nature of higher education institutions, their objectives, environments, and many other variables, which make any judgement of the quality of graduates very difficult.

In the literature solving such problems is not easy and since the quality of higher education graduates largely depended on the quality of the staff, the student intake and many other factors, one needs to review the quality of the education system as a whole. At the same time, the national objectives for each country and its political system play a major role in determining the quality of education system in general and higher education graduates in particular. Beeby, for example, in his discussing the problem of the quality of education systems in developing countries concluded that:

> "If the politicians found it impossible to resist the ground-swell of demand for universal education even at the expense of a loss in quality, so also did the educators...It is no easy business to stand before the crowd and explain that some of them should defer their claim for education of any sort for their children in order that the qualify of other children's education should be improved. lt is especially difficult for a man who has devoted his life to the spread of education and who has no firm evidence that the rapid increase in numbers necessarily involves a drop in quality". (Beeby, 1966, 9).

Herbison shares the similar view when he suggests that:

> "In developing countries the clamour for higher education has become so great and so general that politically, it has become almost imperative to sacrifice quality to numbers". (Harbison, 1973, 22).

In the following discussion we will focus on the quality of the graduates in order to keep our interest on the aim and scope of the present study. Even with this restriction, the problem of finding objective measures of the quality of graduates remains unsolved. For example, Crombag defined the quality of the graduates as "the average amount of subject matter and the depth in which it is mastered by the graduates". (Crombag, 1978, 13). He adds the quality of the graduates can be expressed in terms of the following components:

(a) the number of standardized pages of subject matter to be studied
(b) the number of learning experiences the students can perform successfully
(c) the length of learning experiences, which cannot be broken down into a set of separate learning tasks

Differences in the average quality of graduates at different points in time, as seen by Crombag, can therefore be expressed in terms of proportional differences in one or more of the components of quality of graduates. One should realize that this proposal constitutes a serious over-simplification of the problem, for the following reasons. First, books differ in the level of difficulty and in the degree of redundancy of presentation of subject matter. Secondly, the three components of the quality of graduates probably cannot become completely independent. Finally, the three components cannot be considered to be continuously measurable variables. These difficulties might remain the problem of measuring the quality of graduates as the same.

Browne argues that "the real evidence of quality lies in the subsequent performance of the student and in the skills and knowledge which remain at his or her disposal". (Browne, 1984, 45). This view is very close to the United Kingdom tradition which looks to the personal development in a broad sense, including the general powers of the mind and the coping skills necessary to social and working life. (Browne, 1984, 48). However, difficulties in measuring such aspects still represent major obstacles facing the users of this criterion.

Recently Gapen examined the determinants of educational quality at engineering colleges and its importance on the quality of graduates. (Gapen, 1983, 16). The determinants of quality are discussed in five categories as follows:

1. Measures related to institutional resources.
2. Factors related to institutional and management processes.
3. Students' outcome measures.
4. Value added approaches.
5. Measures related to curriculum structure.

He suggests a number of ways of investigating the quality of engineerng graduates, such as a comparison of the curriculum offered in engineering schools in different countries. This would present serious problems if there were differences between those countries and how one can separate curriculum from other factors, such as cultural differences, social background, previous education, level of industrialization and other economic factors. Another way is the comparison of the availability and utilization of the educational

elements (staff, laboratories, library....etc.) at the same institution during a specific period. This is the most preferred way for present study, since the availability of accurate data, and the measurability of such elements are possible. Two main elements of higher education process - staff and students - will be examined in the following sections. These elements might explain the general direction of the quality standards for the UOT graduates during the last 10 years.

7.3 THE STAFF

The strength of any higher education system depends largely upon the quality and performance of its staff, who represent, apart from the students, the main input to universities. Their efforts in teaching and research outputs can be regarded as a major element determining the quality of university output (graduates and researchers). For the purpose of this study, three aspects of academic staff will be considered - number, qualification, and teaching load. Those aspects might help to draw the general picture of the quality of UOT graduates. Nevertheless, the author will also refer to the situation in other Iraqi universities in which one can generalise the results of current study.

7.3.1 Staff Numbers

Attempts to improve the quality of UOT graduates are hindered by the serious problem of faculty shortages, which impair the efforts of UOT administration to cope with the growing number of students enrolled. Although the number of teaching staff increased from 127 in 1976 to 196 in 1980, which represents an increase of 52% (or 11.5% per annum). This growth did not keep pace with the subsequent growth of students enrolled

which increased by 84% (or 16.5% per annum) over the same period. One encouraging factor is the growth in the percentage of Iraqi staff, which increased from 50% in 1976 to 76% in 1980, as can be seen in Table 7-1. The staff/student ratio however dropped from 1:35 in 1976 to 1:42 in 1980. The ratio also varied even among different faculties at UOT itself. In 1980, it was 1:31 in the faculty of Chemical Engineering compared with 1:62 in the faculty of Technical Teachers. (Ministry of Higher Education, 1981, Table 23).

Though little is known about the impact of close relationships between students and faculty, the belief is widespread that the influence of faculty, as exemplars and as caring persons, can be substantial. For example Gaff, in a study of college impact in eight varied institutions in U.S.A. found that the involvement of college teachers with students significantly affected educational outcomes as perceived by both teachers and students. He wrote that:

> "Influential teachers are heavily interested in undergraduate teaching, and this interest probably motivates them to make their courses interesting, to talk with students about issues which are important to them, and to extend their conversations and interactions with students beyond the classroom. This high degree of involvement with students and student concerns allows them to make an impact on students and to perceive that they are effective. It also leads them to be regarded as effective by their students and colleagues, which probably reinforces their original interest in teaching....The implication is that conditions which increase the amount, closeness, breadth and duration of student/faculty relationships would enhance the educational impact on the lives of students". (Gaff, 1973, 9).

One desirable way in evaluating the student/staff ratio at any higher education institution is to compare it with similar institutions in the same country, or with other countries. However, it would be rash

Growth of Staff and Students Number at UOT

(1976-1980).

Table 7-1

Year	Student No.	Staff No.	Non-Iraqi staff(%)	S/S Ratio (Iraqi staff only)	S/S Ratio (all staff)
1976	4445	127	50%	1:70	1:35
1977	5945	159	34%	1:61	1:37
1978	6801	194	31%	1:51	1:35
1979	7851	193	30%	1:58	1:41
1980	8184	196	24%	1:55	1:42

S/S Ratio = staff/student ratio

Source: University of Technology (1981), Analysing Teaching Load for UOT Staff - 1980, in Arabic, (UOT publications, Report No. 12, Baghdad), p5.

to assume that such a comparison is totally fair, since the type of either staff or students that are usually included are not the same. (Embling, 1974, 187). Nevertheless, such comparisons on the country level might give a general idea about the ratio in that country.

The data available for this study disclosed that although the staff/student ratio dropped at all other Iraqi universities during the 1970s, their situation nevertheless is still vastly better compared with UOT. At the University of Baghdad, for example, the ratio dropped from 1:13 in 1970 to 1:18 in 1980, and, as can be seen in Table 7-2, the ratio at all Iraqi universities in general worsened, going from 1:13 to :19 during the same period, exlcuding Al-Mustansiryh University which in 1970 depended mostly on part-time staff, while in 1980 all the staff became full-time at this university. On the other hand, this ratio varied in 1970 from 1:13 at Baghdad University, to 1:16 at Salah Al-Din University, while in 1980 the ratio varied from 1:16 at Mosul University to 1:42 at UOT. In addition, many of the staff in the newer universities, such as UOT, are inexperienced, untrained and lacking in research. Although the government has been able to direct many staff members in Baghdad University to spend periods of time in provincial universities, the majority have undertaken their tasks with great reluctance.

Certainly the most striking fact to emerge from Table 7-2 is that the situation is so much worse at UOT compared with other Iraqi universities due to two reasons:

Staff/Student Ratio in Higher Education

Institutions in Iraq (1970-1980).

Table 7-2

	Institute	1970	1980
1	Baghdad University	13	18
2	Basrah University	16	20
3	Mosul University	15	16
4	Salah AL-Din University	16	18
5	University of Technology	-	42
	Total Universities (excluding Al-Mustansiriya Univ.)	13	19
6	Al-Mustansiriya Univ.	(*) 208	29
	Total Iraqi Universities	18	20

Sources: Compiled from detailed tables of the Annual Abstracts of Statistics, 1970 and 1980.

(*)The ratio is very low at Al-Mustansirya University because the figure of the staff in 1970 represents only the full-time staff. At that time the university depended largely on part-time staff in carrying out its lectures, and it is difficult to account the accurate ratio for the following reasons:

(a) We do not possess any data about the time spent by each part-time staff equivalent to full-time staff in order to get the real number of staff working as full time equivalents.

(b) It is not possible to account the part-time staff because the majority of them are working at other Iraqi universities. In counting them, the total number of staff at all Iraqi universities will be exaggerated.

1. The UOT plan for staff recruitment was prepared after 1975, and the execution of such a plan usually takes a long time from sending graduates abroad until getting them back after three to six years, with a considerable proportion of wastage (dropouts, migration...etc.)
2. It is difficult to get qualified staff, especially in engineering fields, from other Arab or developing countries (Egypt, India...etc.) because the shortages in these fields are found in many countries and international competition is very high.

For the above reasons the UOT administration could not recruit enough qualified staff between 1975-80 to keep pace with the increase in the number of students. In comparison with the staff/student ratio in other Arab countries, Iraqi universities seemed however to be in a better situation in both the proportion of decreases which occurred in the 1970s and the ratio in 1980, as shown in Table 7-3. Nevertheless, in comparison with some developed countries, UOT is too far behind to reach the ratio in those countries. (Hamame, 1985, 53).

The present situation of staff shortages at all Middle East universities is very well described by Zahlan when he states that:

> "the problem of faculty shortages was never given adequate consideration in the Arab Middle East universities which were established ad hoc by government officials. As to the Iraqi situation, although numerous reports and studies were submitted, their recommendations were not implemented for a decade or more" (Zahlam, 1969, 314).

He stresses that :

> "the most important single element in a university is its faculty, which is self-propagating, it stamps every activity of the institution with its identity. Thus, when a new university is being founded, every effort should be made to create the necessary conditions to attract a competent faculty" (Zahlan, 1969, 314).

Staff/student ratios are widely varied even among other engineering schools at Iraqi universities. In 1980, for example, they ranged from 1:15 in the engineering school at Baghdad University, to 1:35 in the engineering school at Salah Al-Din University (University of Technology, 1981, 8), even though they were still better than the UOT ratio which was 1:42 in 1980. This ratio is more than five times the ratio of engineering studies in British universities which was 1:7 in 1982. (University Grants Committee, 1982).

In general, there are no firm rules for determining a desirable staff/student ratio at any institution of higher education. Naturally, from the students' and teachers' viewpoints, the lower ratio the better it is. Blau stated that "too high staff/student ratio will have adverse effects on education" (Blau, 1973, 86). Such effects are also confirmed by a study carried out by Khalil and Hamame, at UOT in 1980, when they found a significant relationship between the dropout rate and staff/student ratio. The correlation coefficient was .,79 (Khalil & Hamame, 1981, 119).

It is reasonable to conclude, however, that the ideal ratio is also a function of the type of teaching methods being used, which in turn should be a function of the university's educational goals and

Staff/Student Ratio in Selected Countries

1970 and 1980.

Table 7-3

	Country	Students per staff	
		1970	1980
1	United Kingdom	6	7
2	West Germany	8	8
3	Japan	13	11
4	U.S.S.R.	17	14
5	Saudia Arabia	12	9
6	Kuwait	12	15
7	Iraq	18	20
8	Lebanon	15	28
9	Jordan	17	26
10	Sudan	16	23
11	Egypt	18	23
12	Morocco	25	55
13	Syria	38	57

Source: Hamame, Y.T. (1985), Primary Indicators for Measuring the Performance of Arab Universities, Arab Journal of Administration, Vol. 9, No. 2, Spring, Jordan, (Arabic Version), pp.40-55.

philosophies. However, to a large extent the existing staff/student ratio at UOT (and at most Iraqi universities) are results of more or less unplanned historical evolution, and high rates of growth of enrolments during the 1970s, and need to improve in future years.

7.3.2 Staff Qualifications

Academic qualifications represent one fundamental measurement of the quality of the staff. It is often argued that the amount of training the staff has had will have a positive effect on their teaching and on the quality of the graduates. In Iraq the lack of staff can also be recognized in terms of the academic qualifications of a teaching faculty, particularly in the new universities, such as UOT. Between 1975-80 the proportion of UOT staff who held a Ph.D. improved slightly, it increased from 35% to 38% (University of Technology, 1982, 12). A higher proportion of those who held a Ph.D. was found in all Iraqi universities. In 1980 the Iraqi universities (excluding the Foundation of Technical Institutes) had a total teaching staff of 4145. Of these 1806 (or 44%) held Ph.D. degrees and 1416 (or 34%) held master's degrees. (Ministry of Higher Education, 1981). This total included 738 non-Iraqis, of whom 484 held Ph.D. degrees and 221 held master's degrees. When we exclude the non-Iraqi staff, the proportion of the Iraqi staff who held a Ph.D. at all Iraqi universities will decrease to 38% (and to 29% at UOT alone).

It is true that academic qualifications should not be the only significant criteria in determining the quality of a university faculty. An individual's competence, post experience and performance also represent significant factors. But in new universities as in the case

in Iraq, the requirement of a Ph.D. degree at this stage in the development of Iraqi universities, provides at least a definite reliable standard.

In the mid 1970s the problem of the lack of academically qualified faculties was alleviated to some extent by new measures taken by the government to patronize Iraqi specialists and scientists working abroad, and to create the appropriate environment for their productive work. The first such measure was Law No. 154 of 1974, which was issued to encourage the return of scientists from abroad by providing them with certain rights and privileges, mostly economic. (Al-Waga, 1974). The most important among them were:

1. Travel expenses of the professional and of his dependants from abroad to Baghdad.
2. Transportation costs of his personal and household effects and their entry free of duty.
3. Tax exemption for one year.
4. A free 600 (m^2) of land for house building and an interest free loan to build a home.
5. A grant of a months salary if the returnee gets married in Iraq during the first six months, plus a repayable payment equivalent to six months salary.

Table 7-4 summarizes the results of these inducements over an 18 month period. The return of 705 professionals is certainly encouraging. It amounts to one third of the total number of highly qualified professionals residing in Iraq with the equivalent of an M.A. degree or above (Shaw, 1981, 648). Moreover, most of the returnees were graduates

of Western universities who had specialized in engineering, and who were badly needed in Iraqi universities. The most important lesson to be learned from this experience is the willingness of emigrant nationals to return.

The law was a necessary step to attract qualified personnel from abroad, and in terms of economic benefits offered it was very generous. However, this law did not take into consideraton other elements which are also essential for the productive use of such personnel, such as starting salaries, promotion regulations, equipment and facilities, and other environmental factors, which hinder the task of encouraging other Iraqi professionals residing abroad to return. The law was abolished in late 1975.

7.3.3 Staff Teaching Load

Another aspect affecting the quality of teaching processes at higher education institutions is the staff teaching load. In recent years there have been many surveys at individual universities in Iraq, usually based on questionnaires addressed to faculty members, designed to determine how many hours a week faculty members actually work and how they distribute their time among various aspects of their work. Among them, a study conducted by "Organization and Methods Office" at UOT, covered the first term of the 1979 year. The study indicated that UOT staff consistently worked about 44 hours a week, but also pointed out that there were differences in this average among UOT faculties from around 40 hours per week in the Mechanical Engineering Faculty to 49 hours in the Civil Engineering Faculty. A summary of the main results is shown in Table 7-5. It is clear that more than two-thirds of staff

Qualified Personnel Returning to Iraq between May,1974-November 1975, in Response to Law 154 by Degree, Specialization and Country.

Table 7-4

Part A: Country of Study

Degree	U.S.A.	U.K.	F.R.G.	Other Western	Socialist countries	Arab Country	Total
Ph.D.	115	177	34	31	36	19	412
Master	94	120	1	6	9	8	238
High Diploma	3	5	46			1	55
Total	212	302	81	37	45	28	705

Part B: Field of Specialization

Degree	Science	Medi-cine	Engin-eering	Agricul-ture	Human-ities	Total
Ph.D.	137	70	87	47	71	412
Master	33	19	109	15	62	238
High Diploma	1	39	12	1	2	55
Total	171	128	208	63	135	705

Source: Figures in the table compiled from detailed records of the Iraqi Commission for Qualified Personnel.

Allocation of UOT Staff Working Hours, by Faculty and Type of Activity, 1979.

Table 7-5 (Percentage)

Activities \ Faculty		Mechan. Eng. (%)	Elect. Eng. (%)	Civil Eng. (%)	Total Aver. (%)
1	Instruction (*)	60	50	45	53
2	Correcting exam papers	17	19	15	17
3	Research	5	8	5	5
4	Consultancy	3	5	11	6
5	Administrative(**)	15	18	24	19
All activities		100	100	100	100
Average working hours weekly for each staff		40	45	49	44

(*) Includes preparation for class, seeing students in class and out.

(**) Includes service on faculty committees and administration.

Source: University of Technology (1981), Analysing Staff Teaching Load at UOT in Arabic (UOT publication, Organization and Methods Office, Report No. 12, Baghdad), p.20.

time is spent in teaching and correcting examination papers which is the natural result of the increasing number of students enrolled in recent years. (University of Technology, 1981, 20).

Closely related to the controversy over the high proportion of staff time spent in teaching is the question of the time spent on research and administration work. The proportion of staff time devoted to research activities was too little (5% only). Meanwhile the proportion of staff time spent on administrative activities constituted about one-fifth of the total staff time. This was increased to reach about one quarter of staff time in the Civil Engineering Faculty, because about one-third of the staff in the faculty were holding top administrative posts at UOT or other government offices, which led to a high proportion of them having few teaching hours per week, as shown in Table 7-6.

It is interesting to note that one-third of UOT staff had more than 20 hours per week, and just under a half had between 11-20 hours per week, as demonstrated in Table 7-6. The average hours spent in teaching by UOT staff was 18 hours per week. This average also fluctuated from one faculty to another. The Civil Engineering faculty spent 14 hours on average in teaching. This was increased to 20 hours among Electrical Engineering Faculty. Compared with staff teaching loads in other countries, UOT staff seemed to have very heavy teaching loads. The available data shows the average teaching load per week was 8 hours in British universities in the mid 1970s (Embling, 1974, 189) and 11 hours per week in Swedish universities in the early 1970s (Burn, 1971, 197).

Distribution of UOT Staff (Full-time) by Number of Lectures per Week (First-term, 1979).

Table 7-6

Number of Hours	Faculty			Total
	Mech.	Elect.	Civil	
Less than 10	9	4	46	19
11 - 20	42	52	50	47
More than 20	49	44	4	33
Total	100	100	100	100
Average teaching hours per staff	19	20	14	18
Staff/student ratio	1:39	1:52	1:42	1:42

Source: University of Technology (1980), Analysing Staff Teaching Load at UOT, in Arabic (UOT publication Organization and Methods Office, Report No. 12, Baghdad), p.12.

With the high growth rate in enrolments, one can expect to increase the staff teaching load in the 1980s. This was disclosed by a recent survey carried out at UOT in the fall of 1983. The results of this survey revealed that the proportion of UOT staff who had more than 20 teaching hours per week increased to 43% compared with 25% in 1979. The average teaching hours per week increased to 21 hours against 18 hours in the 1979 survey. (University of Technology, 1984, 3).

These results clearly showed that in spite of all efforts made by UOT administration, and the authorities at the Ministry of Higher Education to recruit more staff, the problem of heavy teaching loads is still unsolved and more acute. This might have negative effects on the quality of its graduates. One negative result caused by the heavy teaching load for the staff, as concluded by one report, is the substantial increase in the failure rate at UOT during the last five years. It increased from 12% (or 730 students) in 1978, to 21% (or 1600 students) in 1982 (University of Technology, 1982, Table 1). Such increases in the failure rate might absorb any expansion in the enrolments made during the last few years. It is the author's opinion that any future expansion in enrolments needs to be rethought and the problem of the shortage of teaching considered carefully.

In conclusion, the above discussion of the main characteristics of the UOT staff, suggests that the present situation might have a negative influence on the quality of the graduates, the deterioration in staff/student ratio, with the overload on staff time in teaching and administrative duties, hinder any development in the quality of graduates.

In the meantime, UOT as is the case in many other Iraqi universities, will have to make the best use of their staff and improve their working conditions until sufficient numbers of them are available. This will occur when more technical staff are used to help in the teaching process and effective administrative staff used to carry out most administrative tasks, usually carried out by the academic staff. One other possible way is to ask the qualified people who are working in other government offices to give lectures in their fields of specializations, as part-time staff at UOT and other Iraqi universities. The author believes that this alternative will help when a substantial number of those people are available, and they are willing to do so. Moreover such co-operation between UOT and other enterprises would make a considerable contribution by those people when they transferred their experiences from the working fields to the university. Such a contribution could improve the quality of the graduates when they gain more experience about working life.

7.4 STUDENT QUALITY

We have mentioned earlier that there are too many factors affecting the quality of higher education graduates, among them are the quality of the staff, quality of student intakes, type of instruction, method of examination to be employed....etc. After we discussed the quality of staff in the previous section, two main points will be discussed in this section. First, the quality of student intakes, which will also include a discussion about the instruction methods used at secondary level. Second, the allocation of time by UOT graduates while attending UOT courses could help to throw some light on the performance of UOT

graduates, while they were students at UOT. I would like to mention that the availability of the data about these aspects is the only criteria used in selecting and discussing them in order to draw a clear picture about the quality of UOT graduates.

7.4.1 The Quality of Intake Students

We consider first the quality of intake students. While many Western universities are struggling with the problems brought on by decreased enrolments, all Iraqi universities are faced with unprecedented demands for higher education. Over the past ten years enrolments in the Iraqi universities has more than doubled. This expansion can be attributed to political and social pressures, as we stated in some detail in Chapters 3 and 4. Many authorities are aware of the negative effects of such expansion. One important question needing to be answered is when universities accept more students does that mean the admission policy is less demanding than in the past.

A larger intake might not mean lower admission standards. For example, in 1970, about 75% of the intake of students at Iraqi universities obtained on average 60 scores or more (which was the minimum qualifying requirement for university entrance). In 1980 this percentage increased to 95%. At UOT, the minimum qualification required for entrance is 60 scores of secondary examination. However, in 1975, the actual entrants to university was 1251 new entrants, and the lower students' score admitted was 71. In 1980 the actual entrants increased to 1720, and the lower students' score admitted was 79. (Ministry of Higher Education, 1980, 144). This means the minimum standard of entry was attained by more students during the 1970s.

However, there are at least two points to be made:

1. The minimum stated qualifications for university has never been the actual entrance qualifications which have always been much higher. It is therefore possible that the quality of the entrants increased during the 1970s.
2. It could be argued that the standard of secondary scores has declined, which has led more students to attain more scores. Hence the entrance standards were not rising. If student quality at secondary school declines, then a given score will decline in value over the years. In this view the increased number of students with a minimum requirement is merely a reflection of the decline in quality of entrance students.

It would seem that if we must accept the possibility of this sort of argument we must inevitably have to make a judgement (i.e. guess) as to whether standards have declined or not. We can start with Al-Assady's evaluation of the secondary school in Iraq. He stated that:

> "In spite of the progress which has been achieved in the quantitative development of secondary education in Iraq, the intellectual and educational aspects have received scant attention compared to the ambitious Government resources that have been put into education in order to fulfil its role in achieving the aims of the society". (Al-Assady, 1982, 20).

Another Iraqi expert criticised the methods of teaching in secondary education and its effects on the quality of secondary school leavers. He has pointed out:

"The methods of teaching in secondary schools are mostly the old recitation methods. The teacher asks the students to read a chapter or part of a chapter in the textbook, and in the next lesson he asks them questions about it. He does not trouble himself with preparing his lesson with arousing the interest and reasoning powers of students who are thus inclined to learn the textbook by heart. He does not encourage them to read other books. When such a student goes to university he finds it difficult to refer to other books besides the textbook, to listen to a lecture and take notes, to do a reasonable amount of experimental work and so on". (Khadduri, 1969, 155).

It is interesting to note that there are two additional factors which might have their influences on the quality of secondary education.

First, as we pointed out in Chapter 3, the rapid expansion of educational opportunities at secondary level during the 1970s did not keep pace with the increase in the number of teachers. Accordingly the teacher/student ratio at secondary education level decreased from 1:23 in 1970 to 1:32 in 1980. (Ministry of Planning, 1980, 227). This might have caused a substantial fall in the quality of the secondary school leavers.

Second, the lower quality of secondary education might be due not only to the high growth rate of student numbers, but also to crowded schools. The average number of students per school increased from about 300 students in 1970 to over 500 students in 1980 (or increased by 67%). (Ministry of Planning, 1980, 227). Even though some improvements in school buildings have been achieved during the last ten years, the general characters of other school facilities, such as libraries, laboratories, teaching methods, remain discouraging.

Summing up, from the tentative data available to this study, one can conclude that the quality of secondary school leavers fell during the 1970s. The author is guessing that this fell by not less than 30% of the level in the beginning of the 1970s. Such a fall will no doubt have its effects on the quality and performance of the students at higher education level, as we shall see in the next section.

7.4.2 The Performance of Students at UOT

To clarify another aspect of the quality of UOT graduates, this section is intended to investigate some evidence about the performance of UOT graduates, which might help to throw some light on their quality. Three main points will be discussed in this section: the teaching method at UOT, the allocation of working time of students while they attend UOT courses, and students attending at the library.

The previous characteristics of teaching methods at secondary education are not restricted to the secondary level only. It is almost in higher education level as well which was a subject of a direct criticism by many official reports. It was pointed out that:

> "Methods of instruction in higher education are mostly formal, traditional, and emphasize memorization. With exceptions in some subjects and institutions, the old fashioned methods, such as dictated lectures continue unchanged. Students on the other hand, read little beyond a textbook and their knowledge of foreign languages is inadequte for extensive independent reading. In many subjects the literature in Arabic is inadequate to keep abreast of contemporary developments. There is, as a rule, little discussion of intellectual matters with their teachers or fellow students. Their main duty is considered to be to attend uninteresting lectures." (Darwich, 1969, 196).

From the practical point of view, little change has taken place since the above description was cited more than 15 years ago. The following evidence confirms this. Recent study shows that written work for example, is still very rarely done among UOT graduates during university years, a sample of 400 students in their fourth year (which represented about 35 % of total students at this level) at UOT in 1980. The results indicated that 62% of the sample had not borrowed any books from the UOT library during the previous two years. 18% borrowed less than 10 books and the remaining 20% borrowed 10 books or over during the same period. (University of Technology, 1981). The main reasons for this as seen by the author are:

1. Academic staff usually do not require any written work from students, so the students have no motive to do this kind of work by themselves.
2. Library regulations at UOT (at the time of the study) as well as in other Iraqi universities, lay down that junior (i.e. first and second year) students are not entitled to borrow books.
3. The procedures for borrowing books is very long.
4. Finally, and the most important reason is that a teaching day is very crowded. Students on average, have to spend about six hours a day in lectures, workshops, laboratories....etc., which leave no time for doing library work.

The author was aware of this situation and he asked the graduates during the interviews to point out the allocation of their time among the major activities while they attended UOT courses (Appenix 1, Question 17). A summary of the results is shown in Table 7-7. Inspection of this table reveals that graduates on average spent 22

Time Allocation by UOT Graduates While Attending UOT Courses.

Table 7-7

	Activities	Average hours per week	Percentage
1	Classroom work	21.7	55
2	Laboratories	9.1	23
3	Workshop	2.5	7
4	Library	2.4	6
5	Social & private activities*	2.0	5
6	Others	1.7	4
	Total	39.4	100

*Including sports, music, private reading....etc.

hours per week in the classroom, which constitutes about 55% of their total time while they are attending UOT courses. Meanwhile, they only spent 2 hours per week on average in the library, which represents only 6% of their time.

What is even more important to the present study, 66 graduates (or 53% of the sample) disclosed that they had never been in the library during their years studying at UOT. Another 45 graduates (or 36% of the sample) spent between one to six hours per week and the remaining 14 graduates (or 11% of the sample) spent between 7-12 hours a week.

These results are clear enough to suggest that there is a big obstacle in the teaching system at UOT (and might be in other Iraqi universities), which could have a great influence on the declining quality of the graduates during the last five years, and consequently on their performance later in their jobs. The problem of declining quality at higher education has been tackled by many official reports for many years. For instance a report presented at an International Conference of Education gathered in Geneva in 1976, stated that :

> "Although the growth of enrolments in higher education was inevitable, it has been achieved at the expense of the quality of education...In fact, the level of training, from the theoretical and professional points of view, was lowered and the academic community warned about the widening gap in the relationship between quantitative and qualitative evaluation in higher education in Iraq". (Ministry of Education, 1977).

In spite of some improvement in the qualifications of the staff, some libraries, and the quality of teaching at higher education institutions was, however, still unsatisfactory in the 1980s. This is

obvious when the President of Iraq "Sadam Hussen" in his meeting with university staff in June 1982 pointed out that "the quality of teaching in some university disciplines was still below the level which the state wanted". (Al-Thawra, June 1982).

Other experts blamed some environmental conditions which arose during the 1970s in which unsatisfactory behaviour was created, such as the feelings among higher education students that society should be at their service, and they think that their high position means they should be above their society. This behaviour was diagnosed in 1972 when the Beirut Seminar concerning the planning of higher education in Iraq put it:

> "Free higher education in its present form often leads to some carelessness and indifference of the students so long as his failure does not impose on him any considerable burden. The student may even develop a deep-rooted desire to go on feeding on the state and a weak feeling of responsibility. Such a desire is encouraged by many educational methods in Iraq". (Ministry of Higher Education, 1972, 41).

Some results in the present study proved that such a desire actually characterised the behaviour of UOT graduates in their present jobs as we mentioned in detail in Chapters 5 and 6. In the light of the criticisms which have been made, what is the view of the employers and how has the UOT and other engineering schools responded?

Equally important, however, was industry's attitude to the quality of UOT graduates. Overall, there was disquiet about the narrowness and degree of specialization in undergraduate engineering courses, particularly in view of the rapid changes in technology which were occurring. One professional report suggested that "industry wanted its

engineers to have a broader based knowledge of technology, including economic and management aspects, as well as practical experience, rather than specialize in theoretic engineering only". (Iraqi Engineering Society, 6). It was recognized that engineering graduates in general did not have experience and skill in the application of fundamentals to real-life problems. Similar criticisms faced the engineering education systems even in some developed countries. For example, in U.K. engineering education was the subject of a good deal of critical comments, as stated by the Finniston Report:

> "the education of engineers is unduly scientific and theoretical; that newly-graduated engineers lack awareness of 'real life' constraints to text book solutions.....they are not interested in working in production or marketing functions; and they lack understanding of the factors in the commercial success of their employing organization." (Finniston, 1980, 83).

From the academic side, the application of a "two stage system" in engineering education at UOT represents the main step in developing the content and structure of engineering education in Iraq. (See Section 3.3.3). Courses, contents and structure in other engineering schools in Iraq were frequently revised during the 1970s and it would be hard to argue that the system is stagnant in that respect. On the other side, most engineering schools have achieved some sort of integration with local industry on the undergraduate courses, while a few departments had undertaken a "radical review" of the traditional courses in collaboration with industry, leading to new courses more closely related to engineering practice. But these developments appear somewhat exceptional and there is still no clear sign of improvements in the quality of the graduates.

7.5 SUMMARY

Empirical data about the UOT staff and students revealed that the quality of the graduates may have declined during the last 5-10 years. This has been caused by many reasons, among them being the shortage of qualified staff and their teaching load. At the same time, data about the students confirmed that the intake students are ill-prepared for engineering study, and the performance of the student at UOT is unsatisfactory. Less time was devoted to intellectual work, and the majority of their time was spent in classroom work.

Nevertheless, in view of the difficulties inherent in the objective measurement of the quality of graduates over a given period, and as no serious attempt to measure the quality of Iraqi engineers has been undertaken so far, it is difficult to say definitely to what extent and in what respects this quality has fallen. What is, however, apparent and really matters, is that over a large area of higher education, and in spite of all Government reforms during the last decade, the quality of the graduates is still inadequate for our present needs and future requirements. It compares unfavourably with the average standards in educationally advanced countries. Many of our authorities, educationalists, and industrial men, however, have not fully realized how serious are the actual conditions, academic and physical, that obtain in the higher education institutions. Even those who are broadly aware of the situation fail to notice its poignancy because they become used to such conditions.

CHAPTER 8

THE MANAGEMENT OF HIGHER EDUCATION INSTITUTIONS

8.1 INTRODUCTION

As we mentioned in the previous chapter, one other factor which might have an influence on the quality of the graduates is the type and structure of UOT management. In order to understand that, one needs to determine the appropriate management approach for university administration and the general environment in which the UOT works. In section 8.2 of this chapter the author attempts to summarise the latest thoughts about university management, to state the principles and approaches of the organizational structure and some of the managerial processes which flow through this structure.

In section 8.3 the planning process at higher education institutions in Iraq will be examined to see the implementation of the managerial processes at work, which are the same at all Iraqi universities. The purpose of section 8.4 is to examine the present organizational structure of UOT and its environment, which might have a great influence on the decision making process, such as the ways in which UOT decisions are taken, how resources are managed, and how its performance is assessed. These are the main functions of management in any organization. Special emphasis will be placed on financial management, since the relevant data about this aspect are available. The author believes that the analysis of such factors could help in drawing the overall picture about the management process at UOT and its influence on the quality of its own graduates.

8.2 UNIVERSITY MANAGEMENT - THEORETICAL BACKGROUND

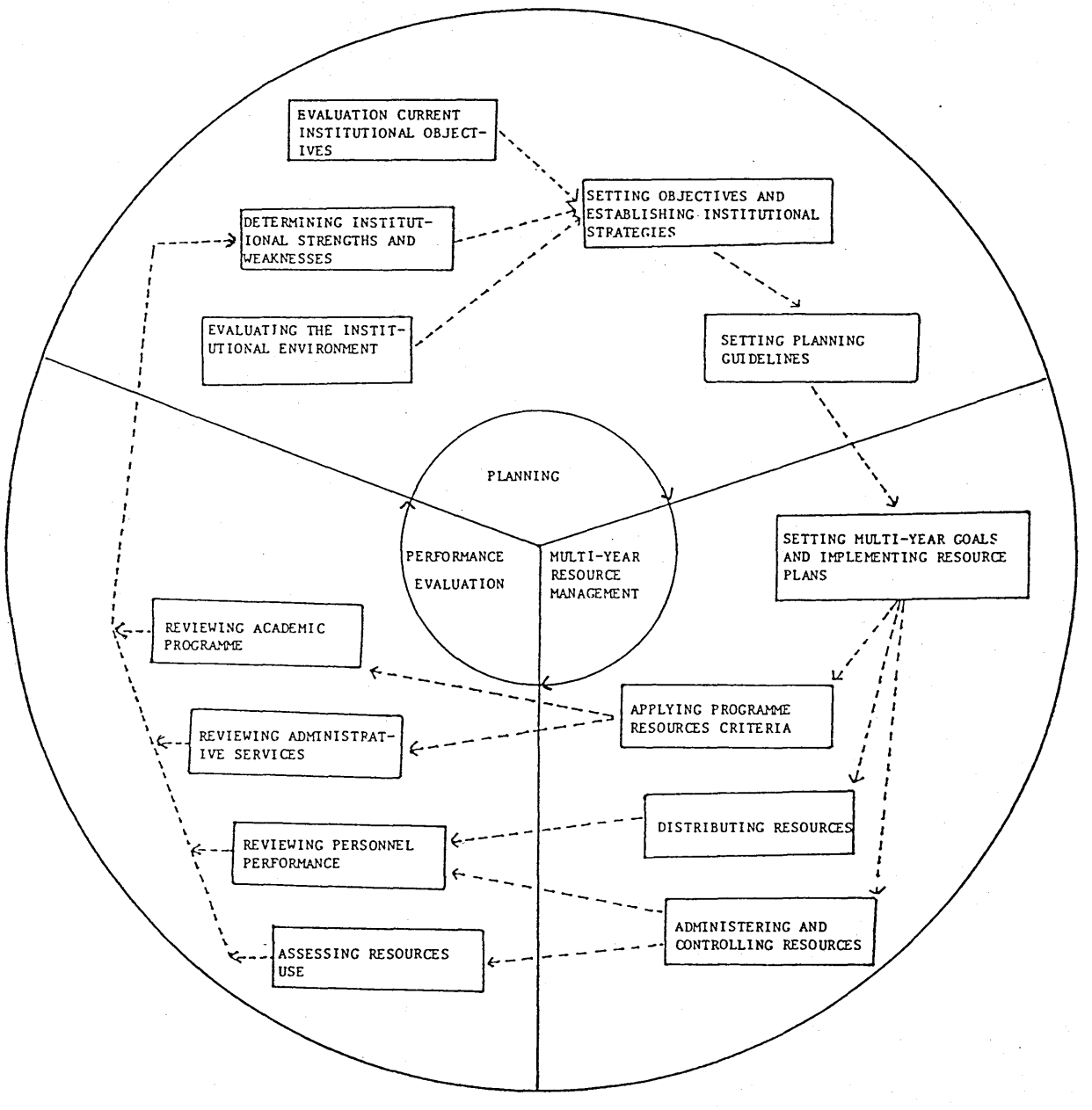
An enormous amount of work has been done on management and organization theory - some of it is useful for many kinds of university administration. Universities can be analysed from many points of view. They can, for instance, be seen as organizations, as institutions or as communities. Studying them as organizations would imply that they exist to achieve concrete ends which are capable of rational analysis. Looking at them as institutions as the embodiment of values would involve a behavioural examination of how their internal processes contribute to the maintenance of those values. If the view of universities as communities is given the primary emphasis, the study would be more concerned with their effect upon the development of groups and individuals (Fielden, 1973). In each case of the above views, one should determine the main elements of the managerial process in a university to solve the problems of how to improve the university management which might in turn help to improve the quality of its graduates.

As stated by McCorkle and Archibald (1982), the primary components of effective management which lead to effective output (graduates) for higher education institutions are: planning, resource management, and assessment of results. These three basic management functions form a cycle - a sequence of management steps, transformations, and intellectual transactions conducted repeatedly over time to reach desired outcomes.

As illustrated in Figure 8-1, in this cycle, the result of evaluation inform subsequent planning, which in turn affects resource decisions, which are then evaluated in terms of their results at the completion of the cycle. Plans will, of course, change and resources will vary over time, but the management cycle, once correctly established, never needs to change. The three essential characteristics of the process are always present - dynamic, integrated and iterative. (McGorkle, 1982, 16). They are dynamic in the sense that plans are viewed as "living" concepts, not as static blueprints that are updated every five years and left unchanged in the interim. Planning, managing resources and assessing results are integrated in the sense that planning and assessment are both attitudes of management and a framework for thinking about and reaching day-to-day decisions. They do not exist "parallel" to an ongoing system of management, nor are they laid on top of existing practices. Instead, long-term strategic planning guides the development of specific intermediate goals that can be transformed into multi-year resource plans and allocation decisions.

Being dynamic and integrated, these three management functions are also iterative and not left to chance. Clearly stated and understood, planning goals guide policy and resource use. Resource decision processes assure that plans are implemented, and both qualitative and quantitative assessment judges institutional effectiveness and efficiency in meeting planning goals (such as the quality of the graduate....etc.) and provides the basis for taking ongoing corrective planning and resource actions. The details of sub-components for this approach are shown in Figure 8-1.

FIGURE 8-1: THE MANAGEMENT CYCLE



SOURCE: THE FIGURE WAS ACCUMULATED FROM DIFFERENT PAGES FROM McCORKLE, CHESTER, O., AND ARCHIBALD, SANDRA ORR, (1982) MANAGEMENT AND LEADERSHIP IN HIGHER EDUCATION (JOSSEY-BASS PUBLICATIONS, LONDON), PAGES 38, 100 AND 140.

The major contribution of the approach to university management (compared with most traditional approaches, such as the Weberian bureaucratic model, social psychological perspective....etc. see Dressel, 1978, 189) is its introduction of an intermediate step between strategic planning and annual resource allocation, in which long-term objectives and strategies developed during the planning process are converted into definite multi-year goals and program plans, to be realized in two to three years. It gives full consideration to the retention, protection and enhancement of academic values and to the complicated decision processes that set higher education institutions apart from most other organizations. It can be conducted in a personal, informal and collegiate manner that meets the needs of faculty and administrators to reach consensus on multiple objectives, allocate resources in the light of them, and evaluate largely non-quantitative outcomes in an environment of shared governance. It feeds the results of such efforts to review the quality of academic programs back into operational decisions, and it provides the basis for developing an information system that provides useful data for assessing results, planning, and managing resources to meet university objectives (McGorkle, 1982, 19).

How these management concepts and processes can best be applied at any one institution will depend on the unique environment of the institution and its structure and leadership. Consequently the remaining sections in this chapter emphasize the basic concepts of management that shaping the past, present, and may be the future of the UOT and other Iraqi universities. This can lead to suggest some guidelines that UOT administrators can adopt in shaping the future of

this institution so that UOT does more than graduating certain numbers of engineers without any interest in their quality, careers and utilization of their talents.

8.3 PLANNING PROCESS AT HIGHER EDUCATION INSTITUTIONS IN IRAQ

As we mentioined in Chapter 3, the higher education system in Iraq is recently established compared with similar institutions in developed countries. Unitl the early 1970s there was no planning process in real meaning, at all higher education institutions. The Ministry of Higher Education asked some international experts to study the structure of higher education institutions and the possibilities to recommend some general guidelines for future planning. As described by one expert:

> "It is not an exaggeration to say that formal planning of higher education did not exist in Iraq at all until the early 1970s. Higher educational policy decisioins of major importance and lasting consequences were often taken off-handedly and were based on sketchy information and personal biases. The onerous effects of this shortsightedness of, and the contradiction of many such decisions still plague the system of higher education in Iraq". (Ghazoul, 1977, 172).

After establishing the "Ministry of Higher Education" in 1970 one of its major tasks was to draw up a comprehensive plan for higher education. Because of the lack of qualified persons who could take responsibility and the lack of basic data necessary for such functions, a planning office was not established until 1976. Two years later the planning office began to work on the first five-year plan for admission into higher education institutions, in co-operation with a technical team chosen from the academic staff of Baghdad University, Al-Mustanseryia University and UOT. After two years of intensive work and more than 50 interviews with about 200 members of university boards,

faculties, department heads and other authorities in higher education in Iraq, the team managed to draw up a proposal plan. This constituted a proposal of the number of new intake students, and the number of academic staff needed over the period 1981-85. (Hamame, 1981). Instead of the essential procedures to be taken to implement the plan, the planning office was abolished at the end of 1981, and the team members told to return to their universities without any reasons being given for such decisions. The remaining officers in the office were distributed to other government offices.

Today there is no planning office at the Ministry of Higher Education, nor at any Iraqi universities, and some aspects of planning process are occasionally carried out by the university boards or by the social department at the Ministry of Planning. Hence the planning of higher education in Iraq is virtually non-existent. This deficiency has already led to serious problems such as the rapid expansion in enrolments without a parallel increase in the number of staff and other facilities, such as building, libraries....etc. This will no doubt have negative effects on the quality of the graduates. There is now at least an official awareness of the dangers of such a deficiency and serious efforts are being made to rectify the situation. Research on educational needs and manpower requirements in Iraq is being endorsed and financially supported with unprecedented vigour by the Ministry of Planning. Already a few preliminary studies on the planning and development have been completed, and many more are in the process of being commissioned by local and international agencies and universities. (See for example Al-Rahim, 1977, Ahmed, 1978, Ghazoul, 1977). Although much has still to be done, the initial thrust has already begun.

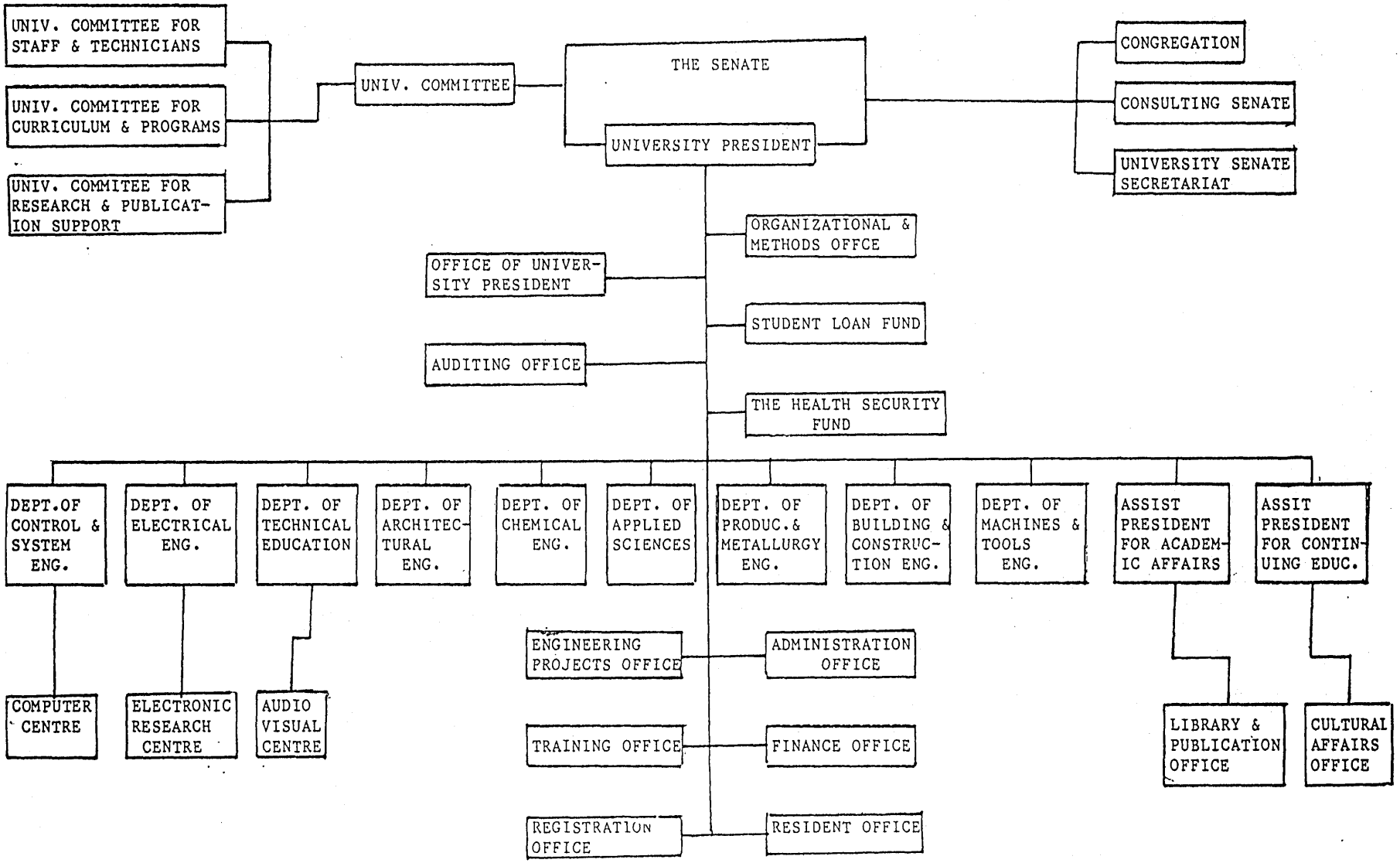
The interesting question arising here is what is the role of the university administration in such circumstances? To answer this question one needs to examine the present organization of UOT, and second, how it works within the Iraqi environment. This will be the main subject for the next section.

8.4 ORGANIZATIONAL STRUCTURE AT UOT

The Iraqi universities are currently using what is called a "faculty system" or school system, where the dean reports directly to the president, and all services including academic and student support are handled by the faculty or school. The staff at the Iraqi universities are happy with the current situation. They believe that according to Iraqi custom, matters are best organized around a "chief". Thus, the faculty system makes complete and appropriate sense when placed in the cultural context.

One cost of the school structure, according to Dressel, "is loyalty to the school or faculty but not to the larger purposes of the university as an institution" (Dressel, 1976). In this case some Iraqi universities construct yet another "ivory tower" that the Ministry of Higher Education wished to avoid. Moreover the faculty structure calls for an unmanageable span of control by the president. He had to reach 22 subordinates at UOT in 1980, as shown in Figure 8-2. One study shows that the span of control in most U.S.A. universities ranged between 4-9 subordinates (Entwisk & Walton, 1976, 523). The increased number of subordinates often leads to disfunctional political struggles among the deans and other directors. A partial explanation of this, as Peterson suggests that "any organization and structure is highly dependent on the

FIGURE 8-2: ORGANIZATIONAL CHART FOR UOT-1980



culture in which it exists; put simply, if the organizational members do not believe in the structure, it will not work". (Peterson, 1970, 107) But we did not forget that the centralization of many academic administrative functions would:

(a) promote efficient use of university resources,
(b) stimulate interfaculty and interdisciplinary activity, and
(c) encourage mixing among the students and faculties from various schools.

According to the above system, the UOT president has two assistants a vice-president for scientific affairs and a vice-president for continuing education, in addition to the number of deans and directors. Each dean has full authority and responsibility for instructional activities and academic administration related to his faculty. The vice- president for scientific affairs, and the same with vice-president for continuing education as well, would have no authority over the deans and would run his activities after negotiations with each dean.

All Iraqi universities follow this system and the author believes that a large proportion of Iraqi deans prefer the faculty system, for the following reasons:

1. Socialism and principles of academic organization aside, Iraqi people usually like to be near the chief. As stated by Adams - "in Iraq the government and business are frequently conducted on a personal basis rather than by law or contract. A personal basis is valid and important in Iraqi society, and people count heavily on a

person's word because of the trust and honesty among themselves. In spite of the spread of education, rising incomes and the fact that some people in the largest cities have adopted a new set of values, the majority of the Iraqi people live traditionally". (Adams, 1968, 11). It is therefore an Iraqi cultural mandate that all deans report directly to the president and have full control over all aspects of academic administration.

2. Most faculty members were educated in classical and European schools and they are happy with a rather flat structure of university.
3. It is quite possible that a flat academic structure would permit each dean to respond quickly to the development needs of Iraqi society in his own way.
4. Finally, the separate location of the colleges in most Iraqi universities (except at UOT which is in one campus) made using this type of organization inevitable in the higher education system.

Moreover, UOT as an example of Iraqi universities, is organized as a part of the state bureaucracy, and is given very few autonomous powers of decision. There are several levels of authority over the university, including not only the Ministry of Higher Education to which it belongs, but also two other ministries (those of planning and finance), and a variety of non-ministerial agencies (curriculum committee, student affairs committee, teacher union....etc.) Nearly all important decisions concerning the university have to go "high up" in the relevant ministry. The admission of students, staff appointments, budget and curriculum decisions require approval from a number of sources outside UOT administration. This was giving UOT administration and all other

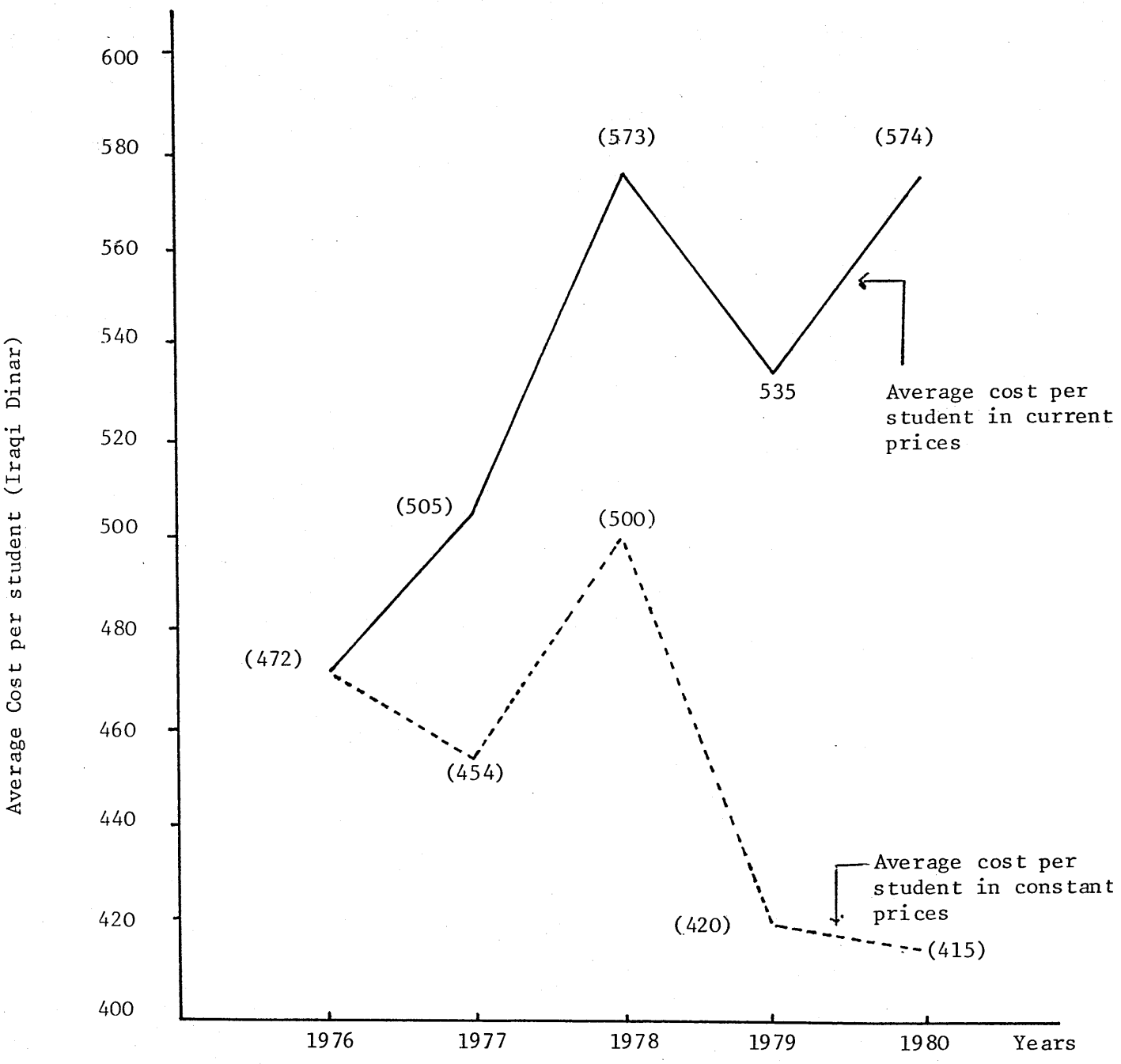
Iraqi universities very little scope to meet the demand for higher education.

These facts become clearer when we examine financial management at UOT. The UOT budget has risen from I.D 2.1 million in 1976, to 4.7 million in 1980 (at constant prices). This increase, however, was not planned by the UOT administration. It is the result of different decisions, mostly taken by outside agencies, such as the Ministry of Higher Education (student enrolments), Ministry of Finance (total annual grant) and the Ministry of Planning (establishing a new department, expanding the existing laboratories).

Accordingly, one can note that the average cost per student at UOT has not risen steadily, year after year, when expressed in constant prices as shown in Figure 8-3. It increased between 1976-78, because the government was willing to pour rapidly increasing resources into higher education institutions in general, as a result of increasing government revenues from oil wealth. Two years later, because the increasse in the inflation rate (18%) and in the number of students enrolled (20%) were more than the increase in the budget in constant prices (3%), the average cost per student decreased in 1980 (Figure 8-3, Table 8-1).

The implicit assumption made in calculating the average cost per student is that within the UOT the students contribute to university costs equally, regardless of their particular faculty or level. Though not entirely accurate, the use of this procedure for calculating the average cost per student is universally accepted (Gahzoul, 1977, 184). For short of developing an elaborate and sophisticated budgeting system

Figure 8-3: Average Cost per Student at UOT (1976-1980)



Source: University of Technology (1981), Financial Report of 1980, in Arabic, (Unpublished Report, UOT Financial Office, Baghdad).

Growth in UOT Enrolments and Budget During the Years 1976-80 (In current and constant prices).

Table 8-1

Year	Total budget (Millions I.D.)		Enrol-ments	Average cost per student enrolled (I.D.)		Growth (%)		
						Enrol-ments	Total Budget	
	Current Prices	Constant Prices		Current Prices	Constant Prices		Current Prices	Constant Prices
1976	2.1	2.1	4445	472	472	100	100	100
1977	3.0	2.7	5945	505	454	134	142	129
1978	3.9	3.4	6801	573	500	153	186	162
1979	4.2	3.3	7851	535	420	177	200	157
1980	4.7	3.4	8184	574	415	184	224	162

I.D. = Iraqi Dinar

Exchange rate in 1980 is $3.3 = Iraqi Dinar.

The price index used everywhere in this study quoted from:

Ministry of Planning (1980) Annual Abstract of Statistics - 1980 (Central Statistical Organization, Baghdad).

(Note: The general prices index for the years 1976-80 are 133, 145, 152, 169 and 179 respectively. The base year is 1973 = 100).

for the UOT, the specific cost data of different courses and specializations within each faculty cannot be determined (central spending). On the other hand, since the various faculties within the UOT are usually very closely related, especially in laboratories, practical training and general and social sciences courses, the margin of error in such calculations is probably negligible.

Not only does such a decrease in the average cost per student have a negative effect on the quality of UOT graduates, so does the distribution of its annual grant among the major activities, which is most important, and which is mostly taken by outsiders. In 1976 for example, less than 1% of total university expenditure was devoted to research activities, while more than 20% was spent in administration (including administrators' salaries and administrative expenditure), as shown in Table 8-2 and Figure 8-4. At the same time, the proportion spent on laboratories decreased from 33% in 1976 to only 12% in 1980. Although the situation in 1980 was slightly better regarding research activities, it has deteriorated regarding administrative expenditures, which reached 27% of the total UOT budget in 1980, compared with only 8% at most British universities (Fielden, 1973).

The above result shows that not only has the average cost per student decreased in real terms, but also indicates that the proportion of the budget devoted to developing teaching quality has decreased. As pointed out earlier in Chapter 7 the staff/student ratio deteriorated from 1:34 in 1976 to 1:42 in 1980. Similar trends can be observed regarding laboratory expenditures. One can suggest that most of the increases were absorbed by administrative expenditures and students' stipends. Accordingly, more than half of the UOT budget in 1980 was

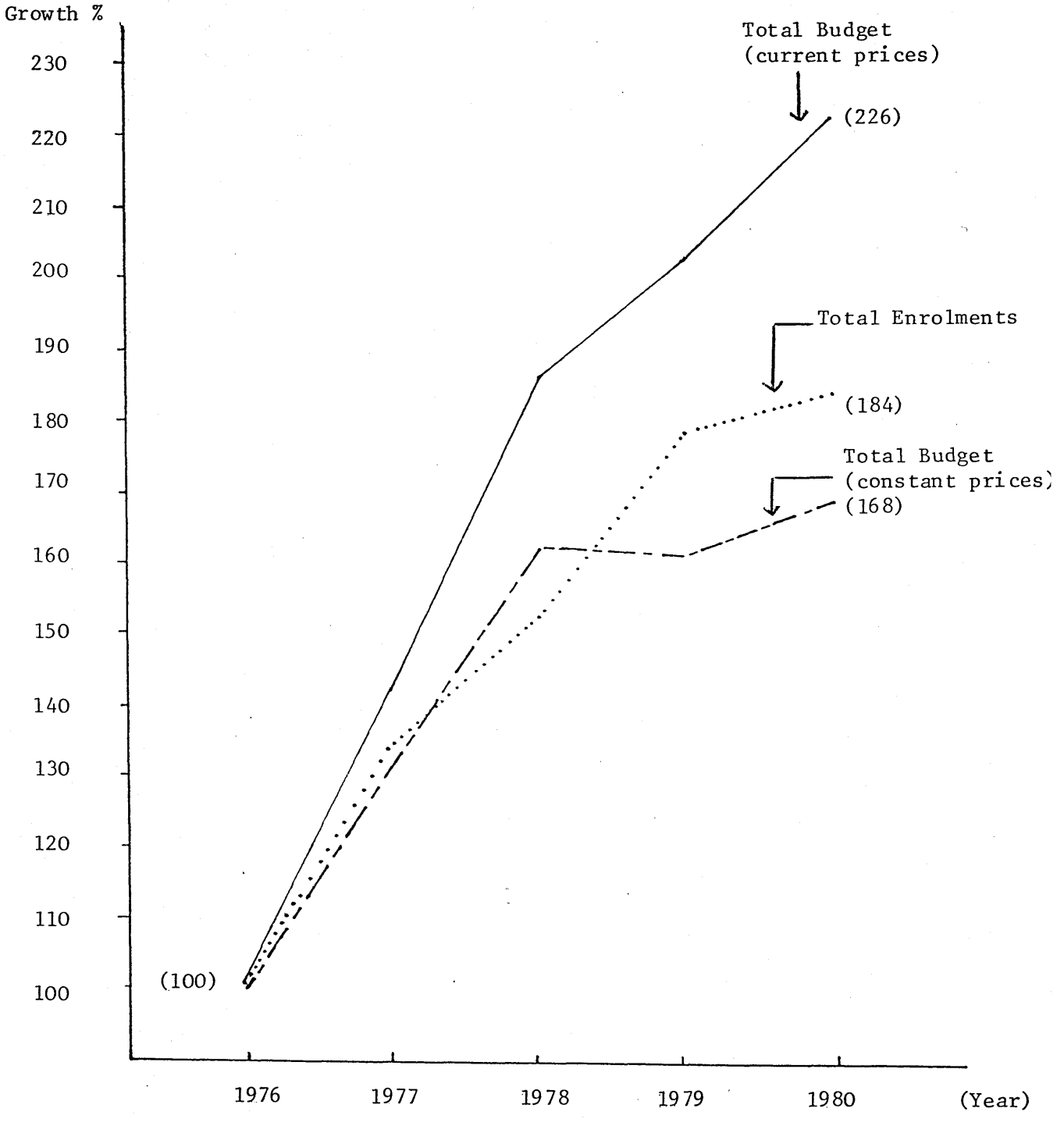
UOT Budget for 1976 and 1980.

Table 8-2 (Percentages)

	Type of Expenditure	1976	1980
1	Salaraies for Iraqi staff	18	20
2	Salaries for foreign staff	14	14.7
3	Students' stipend	15	25
4	Laboratory equipment	32.5	12
5	Scientific research	0.5	1.3
6	Administrators' salaries	9	13
7	Other admin.expenditure (stationery,bills,transport)	11	14
	Total	100.0	100.0
	Total budget (Iraqi dinars million)	2.1	4.7

Source: University of Technology, Financial Reports for 1976 and 1980 in Arabic (Unpublished Report, UOT Financial Office, Baghdad).

Figure 8-4: Growth in Budget and Enrolment at UOT (1976-80).



spent on those activities, compared with about one-third in 1976. Such management is unlikely to improve qualified graduates.

Similar types of organizational structure are operated in all Iraqi universities. A case in point is the University of Baghdad. In 1976, the author conducted a study concerning the organizational structure and administration of the University of Baghdad. Among his findings was that the administration expenditure absorbed about 20% of the total university budget. A similar proportion was spent on students' stipends (Hamame, 1976, 628). Another finding relating to the stucture of the labour force, was that the rate of increase in the number of university employees exceeded that of students. Such growth was mostly among administrative personnel and unskilled workers rather than among professional employees whose talents and skills are most likely needed by the system. The study has also disclosed that the total salary of the university administrative employees in 1972 constituted 20% of the total university expenditure, compared with 33.6% for teaching staff and 7.1% for laboratories, books and periodicals. This trend has continued even though the ratio of the salaries paid to administrative personnel and labourers was increased to 25% of the total budget in 1976, while the allocation for laboratories, books, and periodicals was increased to 11% of the total. What is more striking is that the administrative body of the University of Baghdad was composed of a huge number of low level personnel whose main function is to perform simple services, such as drivers, janitors, carriers....etc. In 1975 60% of the 4.849 university administrative employees were of low level, i.e. they did not hold even a primary school certificate (Hamame, 1976, 522). This clearly indicates the type of administration which is insufficient to cope with

the increasing complexities of higher education. Essentially the university administration in Iraq suffers from all the administrative deficiencies of the government bureaucracy.

Thus higher educaton in Iraq seems to need a well-balanced budget more than an over-saturated administrative bureaucracy. Such a budget would ensure financial support for activities promoting research, knowledge and a highly qualified administration. Future plans ought to consider seriously the elimination of administrative expenses, which has made higher education relatively costly, a saving which could be used to improve the quality of education. Increasing the efficiency of administrative personnel through pre-service training programmes seems a possible means for achieving this goal (Al-Rahim, 1978). In addition, for more efficient administration with a minimum number of employees, the administrative structure of higher education needs to be reorganized on the basis of assigning only the required administrative capabilities to various administrative functions.

Summing up, the above argument in regard to UOT's ability to manage and influence its activities shows that UOT has a very limited influence on its costs per student, on the distribution of its budget among the main activities, on the type of courses to be taught, on the number of staff needed....etc. Consequently, it has virtually no influence on the quality of its own graduates.

One can conclude that the present situation of university management at UOT is far from practising the management function cycle suggested by McCorkle and Archibald. Even though sometimes it seems to take selected procedures which can lead to completing the cycle, the

present external environment of UOT, does not seem to show a continuous process as suggested by McCorkle and Arhibald.

8.5 SUMMARY

In the last two chapters, evidence was presented showing that the quality of UOT graduates is most likely to fall or decline rather than improve or stay constant. It is difficult to quantify the extent of the deterioration, but it may be estimated to be between 15% to 30% since 1976, which is in accordance with the decline in staff/student ratio and in average cost per student. This then gives rise to the question of how UOT administration responds to it.

There is no doubt that the decision-makers in higher education systems are aware that the rapid increase in students enrolled might have led to a decline in the quality of graduates, since other main elements such as staff, books.....etc., have not increased in the same proportion. The difficult question here is whether the authorities wanted to achieve the quantitative targets (increasing the number of the graduates) rather than the qualitative targets (high quality of graduates). This question is difficult to answer. What is clear is that since there are many bodies influencing the decision-making in higher education institutions, most of them outside the universities, and with different interests, it was nobody's job to take a unified look at the consequences of the large expansion in enrolments and its effects on the quality.

Therefore, the government's task in future years is to clear the main objectives of the higher education system, not only in the short-term, but in the long-term as well, and delegate the appropriate authority to the university administrators, to achieve these objectives. Then the responsibility for the UOT management would be possible to consider.

CHAPTER 9

SUMMARY OF RESEARCH FINDINGS AND RECOMMENDATIONS

9.1 SUMMARY OF THE STUDY

9.2 THE MAIN FINDINGS

9.3 RECOMMENDATIONS

SUMMARY OF RESEARCH FINDINGS AND RECOMMENDATIONS

The purpose of this chapter is to present a summary of the main objectives and methodology used in this study. It also includes selected findings and conclusions reached by analysing the data. Moreover, the third part of this chapter formulates and puts together some recommendations to improve the present utilization of UOT graduates, and to develop some other aspects at UOT and other higher education institutions as well.

9.1 SUMMARY OF THE STUDY

The study has set out to consider whether the rapid expansion in the higher education system in general and in engineering education in particular, which has taken place over the last decade, is in fact succeeding in satisfying the social demand for higher education and whether the graduates are being utilized effectively. More specifically, the study was intended to investigate the following questions:

1. What are the main socio-economic factors leading to the increase in social demand for higher education in Iraq?
2. What are the major reasons influencing secondary school leavers to pursue a specific field of study in higher education?
3. How have the higher education institutions developed and coped with the increasing demand for higher education?
4. How effectively is the present stock of highly qualified manpower utilized?

5. What is the effect of public policies practiced in the labour market on the present utilization of highly qualified manpower?

To provide appropriate answers to the research questions, the first step was to review a wide range of literature by foreign and indigenous authors dealing with relationships between higher education and the labour market, especially in developing countries. This type of study is connected with different fields of study such as economics, education, manpower and administration. Publications from the relevant ministries in Iraq, such as the Ministry of Planning, Ministry of Higher Education and the Ministry of Education, were most helpful in conducting the research. Second, a questionnaire was designed and 125 personal interviews were carried out for the 1980 graduates (see Appendix 1). This was the more preferable way to questionnaire survey to collect the data in researches conducted in developing countries, like the Iraqi case, for the following reasons: (a) to secure a high proportion of returns, (b) to collect other supplementary information about the informant's personal characteristics and environment which is valuable in interpreting results, and (c) the quality of the data is typically higher than data from other collecting methods. The nature of the study, the diversity of the data sought, and the need to ensure some degree of anonymity were some other reasons which favoured the use of the organized interviewee in this study. Third, the sample of the study was drawn from the University of Technology (UOT) for the following reasons:

(a) Since the mid 1970s the shortage of engineers has been more visible than that of other qualified manpower in Iraq.

(b) More than 50% of the Iraqi engineering graduates in 1980 graduated from UOT.

(c) Since the recruitment, promotion and salary policies are similar for all Iraqi graduates, one can, to a certain extent, generalize many of the results obtained in the present study.

Fourth, the data were statistically analysed with the aid of a computer. A conventional level of significance of 0.05 was used in testing the validity of the results achieved by the various techniques of analysis employed.

Finally, the findings were discussed throughout this thesis.

9.2 THE MAIN FINDINGS

First, the main factors behind the high growth rate in the level of higher education enrolments in Iraq were:

1. The high rate of growth of population during the 1960s, which was over 3% per annum, remained high during the 1980s, a rate which will lead to doubling the 1977 population before the end of this century. In 1985 nearly 65% of population is under the age of twenty and the school age population represents 45% of the total. This fact has a significant effect on the demand for higher education during the next two decades.
2. The large increase in the standard of living as measured by of gross national product per capita (it grew five-fold during the 1970) led to increase in the demand for higher education by all classes in the Iraqi society.

3. The number of qualified secondary school graduates which has about tripled between 1970-80 (Table 4-1).has been the most important factor for increasing demand for higher education, This high growth in the number of secondary school gradutes put great pressure on higher education institutions, and it is still doing so in the 1980s (Figure 4-1).
4. As a result of a large investment during the 1970s, (which had increased from less than I.D. one billion during 1952-69 to over eight billion during 1970-80) the demand for highly qualified personnel, especially engineers has increased.
5. There is a social factor which motivates people to look for higher education, because most of the members of the high class families go on to higher education, which might give them access to some key positions. People from low-income families believe that higher education will give them social mobility for the upper classes and access to many important jobs.

The author believes that since the above factors are still evident during the 1980s, such growth is likely to continue at least into the next two decades. Higher education institutions must take into account the above factors in any future plans in order to satisfy the social demand for higher education in Iraq.

Second, on average, the pass rate at the end of secondary school is about 70%, and the proportion of secondary school lavers in Iraq who go on to university education was very high (72%) during the 1970s, even in comparison with other developing countries. (Note: The 72% quoted here represents the percentage of candidates that have met the academic

requirements to enter the higher education institutions). The 28% rejections were due to the limited capacity in those institutions. Researching the major reasons influencing secondary school leavers to pursue a specific field of study in higher education, the results of the study show that of the engineering graduates interviewed, about half of the sample had chosen medicine as their first choice for study when they applied to the university, while the other half wanted to study in engineering fields as their first choice, because the doctors are paid more than engineers and other professionals. (Section 2.4 and Table 4-4). It was also shown that only one out of four graduates studied in a field that was their subject of first choice, when they applied to the university, i.e. 75% of the graduates studied in fields which was not in the area of first choice. (Table 4-4). This was shown to have a substantial influence on their performance later at university and their future jobs. Other results about the socio-economic background of UOT graduates were:-

1. The study results showed that students' educational progress both at secondary and higher educational levels is clearly affected by their parents' educational level. Significant relationships were found between father's educational level and secondary school points. The correlation co-efficient was 0.31 with significance at 99%, and between mother's educational level and secondary school points. The correlation co-efficient was 0.27 with significance at 99%. (Section 4.4.1 and Figure 4-3). Meanwhile less significant connections were found between

parents' educational level and the student's performance at UOT. (The correlation co-efficients between fathers' educational level and students' performance at UOT was 0.15 - with 95% significance, and between mothers' educational level and students' performance at UOT, was 0.20 - with 99% significance, respectively.) The second set of correlations was lower because a high proportion of UOT sample graduates studied in fields which were not their first choice. When we further investigated such relations a significant relationship was found between those who studied in their subject of first choice and their university grades. The correlation co-efficient was 0.49 with 99% significance. This point emphasises that the interests of students are as important as their secondary school scores for predicting their subsequent achievement at UOT.

2. Students coming from families where the fathers were working in most active and profitable occupations such as doctors, professors, contractors and government employees still occupy the best places in Iraqi universities during the last few years. (These represent 46% of UOT graduates - Section 4.4.2).

3. The students coming from families originating from Baghdad represent a high proportion of UOT graduates (those represent 47% of UOT graduates). (Section 4.4.3). This high proportion resulted from the relatively high availability of secondary schools in Baghdad compared to other small cities.

Third, higher education institutions found many difficulties in coping with the pressure to increase their enrolments. The most important one was the shortage of academic staff, especially at UOT, which led to heavy teaching loads for most staff members (80% of UOT staff had more than 10 teaching hours per week. Section 7.3.3.) The other problem facing higher education institutions was the lack of authority in decision-making over the major aspects of their work, such as admissions, budget, recruitment of staff. (Section 8.3). This put the administration of higher education institutions in a difficult situation, especially in determining the quality of their intakes and their graduates.

The admission of ill-prepared students to institutions of higher education (Section 7.4.1) is caused partly by the pressure from secondary school graduates (and from their parents)who wish to attain higher education for their personal reasons (social demand), and partly by the need for a rapid increase in the number of trained personnels needed for the numerous development projects which were being undertaken or envisaged in Iraq during the 1970s. This need which was regarded by the policy-makers (mostly in the Ministry of Planning) as an emergency, brought into institutions of higher education, a large number of students whom they would have difficulty in educating properly, without due regard to the adequacy of their facilities, including many who were not well equipped for this level of education. This resulted in a lowering of the quality of both admission and of performance. The quantitative need conflicted with a qualitative one, which was in fact no less basic or urgent. It is necessary for the health of

institutions of higher education, and more importantly, for the broader interests of national welfare, that high standards of admission and of achievement should be maintained, and that the quality of higher education should not to be sacrificed for the sake of quantity. As leadership in all fields must come largely from graduates of institutions of higher education, any weakness in their intellectual or moral preparation will harm the fundamental interests and the future welfare of Iraqi society.

Fourth, the annual output of engineering graduates increased five-fold during 1970-80 (increased from 650 to 3060), especially after the establishment of UOT in 1975, (Section 5.3) Predictably, the shortage of engineers became less, and might be some surplus at the beginning of the 1980s. So the present shortage claimed by some official reports can be explained from the following points of view:

(a) the present engineering stock may be ineffectively utilized, and

(b) the quality of graduates may be low which leads to a fall in the productivity of the graduates in their current jobs.

Our research results showed that poor utilization of the present stock of engineers is one among many factors responsible for the apparent shortage of engineers still claimed by some official reports. Our results confirm such conclusions when 60% of the sample reported that they were working in engineering but outside of their area of specializations or in non-engineering

fields. This might resultin a real but unnecessary shortage equivalent to 60% of the present stock of engineers. (Section 5.4, Table 5-3A and 5-3B). Moreover, even those who are working in their own fields of specialization mentioned that they usually spent less than one-third of their working time on applied engineering works. (Section 5.5 and Table 5-10). Such utilization of engineering talent will no doubt cause shortages, no matter how the number of graduates increases.

What precisely these results mean is that a high proportion (60%) of UOT graduates are not effectively utilized and are employed on functions that could be just as effectively carried out by other qualified individuals, or even less qualified people, such as technicians and clerks. One possible explanation might be that the number of new engineers exceeds the vacancies for graduates in the Iraqi labour market. Hence many engineering graduates face difficulties in finding jobs in areas of their specializations. This leads them to accept any job, even if these jobs are in engineering but outside their area of specialization or even in non-engineering fields. For this reason, we consider that the answer for many claims repeated in some official reports that there is a shortage of engineers, such shortages are artificial and not real. The low quality of the graduates is the second possible factor that may have an effect on the apparent shortage of engineering manpower. Our study indicates that the quality of the graduates ha declined during the last ten years. This has probably been caused mainly by two factors:

(a) The acute shortage of qualified staff was clear when staff/student ratios reached 1:42 in 1980 compared with 1:35 in 1975, which led to a heavy teaching load for the present staff to reach more than 10 teaching hours per week for about 80% of UOT staff. (Section 7-4).

(b) The performance of the student at UOT is unsatisfactory, when less time was devoted to labs and individual projects, and too much time was devoted to attending lectures when no individual intention and no scope for discussion. (Section 7.4).

It is difficult to quantify to what extent those factors have lowered the quality of the graduates and contributed to the apparent shortages. We suggest that this "shortage" involved by a chain of complicated variables. They were complicated because at the same time they were both cause and effect. For example, poor utilization of the present engineering stock was caused by the low quality of the graduates, which was caused by the high pressure put on the engineering schools to accept more students in order to satisfy the anticipated demand by the labour market. no proper manpower survey as ever been carried out in Iraq for educational purposes. Decisions to establish new engineering schools or expanding the existing ones, have been largely political without adequate preparatory analysis especially before the 1970s.

Fifth, it was suggested in the study that the ineffective utilization of the present stock of engineers (which led to the shortage claimed by some official reports), might also be caused by deficiencies of public policies practiced in the labour market, such as recruitment

policies and salary schemes. Our results show that the present recruitment policies are inappropriate and cause a mal-distribution of the engineering graduates, while graduates find themselves in jobs irrelevant to their training. As pointed out by the respondents, two main factors explain why engineers work in irrelevant jobs. The first is the obligation to work with the government enterprises. The second is a preference for jobs are in their home towns. (Table 5.5) Our study also demonstrates that the average salaries of engineers (in current price) increased less than salaries in other professions in Iraq, (social science graduates are the only exception Section 6.2 and Table 6-1), even less than the earning of skilled or unskilled labour. (Table 6-2). At the same time, when we measure engineering salaries in constant prices they actually fell during the 1970s (Section 6.2.1).

The results of the present study show that engineers who work in fields other than their area of specialization are getting higher salaries, and gain promotion quicker than for those who are working in their own fields of specialization. (Section 6.2.2 and Figure 6-2). The importance of factors relevant to the labour market, such as first annual income, type of enterprise, total working hours....etc., was clear as it explained a significant variance of the engineers' salaries in the sample, while socio-economic factors, such as place of birth, parents' educational level....etc., and personal characteristics, such as gender, specializations....etc., have no significant influence on the annual income of engineers. (Table 6-4). One can suggest that more effort should be devoted to the job environment in order to improve the present utilization of the graduates.

Sixth, the research results suggested that the way the UOT is managed might have an influence on the quality of the graduates. The results show that :

(a) The UOT management has been given little autonomous power of decision. There are several levels of authority over the university, and the UOT management has no authority to take decisions on the main problems facing the university, such as admission policies, curriculum and budget.

(b) During the seventies there were no short-term or long-term plans for the higher education system. This led to serious problems such as the rapid expansion in enrolments without a parallel increase in the number of staff and other facilities. This unplanned growth will no doubt have negative effects on the quality of the graduates.

9.3 RECOMMENDATIONS

On the basis of the results of the present study, one can suggest some recommendations which could help in improving the present situation of higher education in general, and engineering education in particular, as well as to improve the job environment of highly qualified manpower. Most of our recommendations will concentrate on developing the job environment for engineers since such elements explain most of the variance of engineering salaries and have a great influence on the present utilization of engineering stock in Iraq.

These recommendations are as follows:

1. The real problem facing the UOT during the 1980s is the insufficient number of academic staff. Because of the heavy teaching load of the

staff the quality of the instruction has recently deteriorated. It is impossible to train the required number of engineers with a high quality if enough faculty members are not available. Therefore, certain staff/student ratios should be improved before there are any increases in student numbers. Ten years ago, the author suggested that the staff/student ratio should be around 1:15 at Iraqi universities, and he still believes so in the case of UOT. The UOT should achieve this target during the next five years in order to improve the quality of the graduates.

2. Engineers, who are extremely expensive to train, should be free from doing jobs that can be done as well by less highly trained people. It is recommended that technicians should be trained in sufficient numbers. Availability of more technicians and support staff makes it possible for engineers to take care of more complicated tasks. This would permit a partial replacement of engineers by a less costly type of manpower - the technicians.

3. The present recruitment policy adopted by the Ministry of Planning since 1975, (Section 6.3), has led to a misallocation of the new graduates. The reasons for misallocation are also discussed in Section 5.4.1. Here the graduates interviewed explained why they accepted jobs outside their own specialization.

4. To use the existing number of engineers more effectively before more are trained, engineers should be given jobs which correspond to their education and experience.

5. Unless the rate of growth of enrolments is slowed down the number of graduates will increase the demand, and the new graduates will be forced to find jobs outside their field of training.

6. Another important factor to promote the effective utilization of engineers lies within the laws and regulations of salaries and promotion. For example salary scales in Iraq are stratified according to educational attainment rather than by job performance. Such regulations should emphasise an individual's competence, experience and performance rather than relying only on the certificate a person holds.

Promotion at the moment is by years of seniority not by performance. Although it is not easy to lay down any subjective criteria for measuring the performance of the highly professional people, it is important for the Iraqi authorities to think about it, and they can ask some professional organizations for help, such as the Iraqi Engineering Union and UOT. Hence the reviewing of the graduates' salaries and promoting criteria is a significant matterwhich should be seriously considered if development programmes are to be staffed with capable employees.

7. Improvement of the recruitment system of graduates by increased interaction between the Ministry of Planning and institutions of employment. Two possible alternatives could be suggested in this respect:

First:- Since it would not be practicable at the present to shift the responsibility of the Ministry of Planning (Graduates' Placement Committee) to each employment institution (due to the complexity of procedures for such decisions), an interaction mechanism between the Ministry of Planning and each institution could be established as follows:

(a) Co-operation between the Ministry of Planning and the planning units in other ministries should be improved in order to make their estimations of engineering needs (and other highly qualified manpower needs) more accurate. This should reflect long term needs, as well as annual needs. These needs could then be used by higher education institutions as a basis for their planning of the new intakes.

(b) Establishment of a career information system to canalize graduates towards institutions where they are needed. Such information should be disseminated among final year university students through pamphlets giving the possible jobs open to different kinds of graduates, and any other necessary information about the job career in different institutions.

(c) To give employers some power of choice, the allocation of graduates could include personal contact between the graduates and the suggested employers who should have the authority to turn back the job candidate when they believe that he/she does not fulfil the requirements for the specific job, or at least to give the suggested employers the right to choose from among more than one candidate before the final decision for placement would be made.

Second: for the long term, the author is of the opinion that graduates should be free to choose directly where and for whom he or she wish to work. It is suggested that each institution of higher education (at university level at

least) should establish its own placement service in co-operation with the Ministry of Planning. The main functions of such services would be :

(a) take note of the requirements placed with the Ministry of Planning by different institutions

(b) take note of different employers' advertisements in the newspapers and in other media and circulate them among the potential graduates

(c) establish contact with potential employers beforehand for possible job availability

(d) invite representatives of employers to the university to interview and discuss jobs with future graduates in their final year

(e) look into the prospects of future jobs for the university programmes and suggest to the senate of the university the admission policy

8. In designing curricula, and evaluating the UOT programmes the importance of interaction between UOT, and may be other Iraqi universities, and the institutions of employment has to be recognized, Such interaction could be achieved as follows:

(a) UOT and some leading institutions of employment could co-operate in designing and reviewing UOT curricula, by inviting some top executives of those institutions to give their opinions about UOT programmes

(b) An office of graduates' follow-up studies could be established at UOT. This should regularly carry out the studies of the utilization of the graduates, their problems in the world of work, and suggest any necessary

adjustment in UOT curricula in order to make them more relevant to the need of work

(c) UOT staff could be encouraged to carry out a practical research about problems facing some industrial institutions. Such work could help these institutions to overcome their problems. The staff, at the same time, would have the opportunity to see the practical problems at work and use their experiences to solve them, and to develop a practical case which could assist them to put these problems in their teaching practice. Such activities will improve the productivity of the industrial institutions, staff experiences and the quality of the graduates.

9. The Ministry of Higher Education needs to re-establish its planning office and to strengthen its planning activities, it should also begin to assume new functions in an effort to relate university education to the labour market in quantitative and qualitative terms by assuming the following tasks:

(a) It should engage in research on the utilization of university graduates and feedback the research results to the institutions concerned to help them adjust their programmes.

(b) It should engage in research on the wastage or under-utilization of other resources (such as faculties, tehnicians...etc.) within the system of higher education. These research results might be useful for the better management of the institutions of higher education.

(c) It should sponsor research on the follow-up of graduates at college level for each institution to identify the problems its graduates face in establishing themselves in the world of work. Identification of such problems will assist the Ministry of Higher Education in formulating policies for a better adjustment between the world of higher education and the world of work. The present study gives some indications of the questions that are to be asked in this type of research.

10. Finally, the underutilization of engineering stock is related not only to the factors within the higher education system and working environment, but also to factors within society generally. The impact of all these factors is bound to have serious repercussions on the general utilization of all qualified manpower in Iraq and not only to the engineers. In Iraq, as anywhere, it is vital to release and fully utilize the highly qualified manpower in order to achieve economic and social progress. Little can be achieved unless wastage of high talent is avoided. Higher education has a special role to play in this process, both from the viewpoint of democratic values and in the interest of national efficiency. Highly qualified manpower must be fully utilized and all barrier in the working environment must be eliminated.

As can be seen from these recommendations there is no simple solution to the problem of developing engineering education in particular, and higher education systems in general, in Iraq. It is hoped, however, that recommendations in this thesis have diagnosed and

might help to illuminate some of the problems. It is hoped that other researchers will continue with other studies in areas touched on but not fully explored in this study.

The present study is a pioneering work as a study of the relationship between engineering education and labour markets in Iraq If, by revealing the dimensions of the problem, it draws attention to the existing situation and helps in some way in the formulation of the policies required for reform, then it will have fulfilled its basic aim.

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APPENDICES:

APPENDIX ONE: The Questionnaire - English version.

APPENDIX TWO: The Questionnaire - Arabic version.

UNIVERSITY OF TECHNOLOGY GRADUATES' SURVEY		Research Use only
Note: Please put a cross (x) in an appropriate box	Questionnaire Serial No.....	☐☐☐
	Card No.....	☐

1 Place of work A.Name of Enterprise ..... ☐

B.Type of Enterprise: Public ☐ Private ☐

Quasi-Government ☐ ☐

Other (specify).....

C.Province of Enterprise..... ☐☐

2 Faculty from which you graduated:..... ☐

3 A. Sex: Male ☐ Female ☐ ☐

B. Marital Status: Single ☐ Married ☐ Widowed ☐ Divorced ☐ ☐

4 Date of birth ..... ☐☐

5 Place of Birth a.Village..... b.town..... ☐

c.Province..... ☐☐

6 In which province did you get your General Secondary School Certificate?..... ☐☐

7 What is the highest educational level of each of your parents?

	No Education	Non-completed Primary	Primary	Intermediate	Secondary	Diploma	Batchelor	Post-Grad.	
A.Father	☐	☐	☐	☐	☐	☐	☐	☐	☐
B.Mother	☐	☐	☐	☐	☐	☐	☐	☐	☐

2		Research Use only
8	A. Father's Occupation	☐☐
	B. Father's Working Field	☐☐
	C. Mother's Occupation	☐☐
	D. Mother's Working Field	☐☐
9	Average marks obtained at the end of secondary school?	☐☐
10	What was your first choice when you applied for university education?	☐☐
11	For which of the following reasons did you want to pursue the academic discipline you indicated in question 10 above? Please indicate the degree of importance you attach to your answer.	

	Very Important	Important	Not Important	
A. Impact of friends	☐	☐	☐	☐
B. Parents' advice	☐	☐	☐	☐
C. For good employment opportunities	☐	☐	☐	☐
D. For social prestige	☐	☐	☐	☐
E. For a high salary	☐	☐	☐	☐
F. You like this field of study	☐	☐	☐	☐
Other reasons (please specify)				
.....	☐	☐	☐	☐
.....	☐	☐	☐	☐
.....	☐	☐	☐	☐

3		Research Use only
12	What was the grade you obtained at the end of your university education? Pass ☐ Good ☐ Very good ☐ Excellent ☐	☐
13	A. Did you require more than eight semesters of enrolment to complete your requirements for graduation? Yes ☐ No ☐	☐
	B. If not, do you believe that you could have finished the course in less than eight semesters? Yes ☐ No ☐	☐
	C. If Yes to question 13B, what is the period you believe you needed to finish your courses? (Please choose one) Seven ☐ Six ☐ Five ☐	☐
14	If Yes to question 13B, what is the most important thing that you need to finish the courses in less than eight semesters? Please rank your answers according to their degree of importance to you.	
	A.	☐☐
	B.	☐☐
	C.	☐☐
15	How would you rate your university courses in relation to their usefuless for your present job?	

	Very Useful	Use-ful	Not Useful	
A. Engineering courses	☐	☐	☐	☐
B. General science courses	☐	☐	☐	☐
C. Laboratory work	☐	☐	☐	☐
D. Library work	☐	☐	☐	☐
E. Summer training	☐	☐	☐	☐
F. Social courses	☐	☐	☐	☐

4		Research Use Only

15 Continued....

Please add any other comments you want

.....	☐	☐	☐	☐
.....	☐	☐	☐	☐
.....	☐	☐	☐	☐
.....	☐	☐	☐	☐

16 Please indicate the degree of adequacy of your university training in preparing you for your present job, in each of the following aspects.

	Very Adequate	Adequate	Not Adequate	
A. The range of subject covered	☐	☐	☐	☐
B. Content of instructions	☐	☐	☐	☐
C. Method of instructions	☐	☐	☐	☐
D. Library facilities	☐	☐	☐	☐
E. Laboratory facilities	☐	☐	☐	☐
F. Assisting in personal problems	☐	☐	☐	☐
(please add any other point(s) about your university training)				
G.	☐	☐	☐	☐
H.	☐	☐	☐	☐
I.	☐	☐	☐	☐
J.	☐	☐	☐	☐

5		Research Use Only

17 On the average, how many hours per week did you work while attending UOT in each of the following activities.

A.	Classroom	( ) hours	☐
B.	Discussion & tutorial	( )	☐
C.	Library	( )	☐
D.	Laboratory	( )	☐
	Other activities (please specify)		
E.		( )	☐
F.		( )	☐
G.		( )	☐
H.		( )	☐
I.		( )	☐
J.		( )	☐
	Total	( )	☐

18 In which field is your present job?

Mech. Eng. ☐	Elect. Eng. ☐	Const. Eng. ☐
System Control Eng. ☐	Chemical Engineer ☐	Architecture Engineer ☐

Other, please specify in at least two words..... ☐☐

19 If you now work in a field other than that of your specialization at university, please indicate your reasons for this change and the relative degree of its importance to you.

	Very Important	Important	Not Important	
A. You were unable to find a job in your field	☐	☐	☐	☐
B. Your present job gives you a higher salary	☐	☐	☐	☐

6		Research Use only
19	Continued C. Your present job offers better carrer prospects ☐ ☐ ☐ D. Your present job is in your ☐ ☐ ☐ Other reasons(s), please specify E. ..... ☐ ☐ ☐ F. ..... ☐ ☐ ☐ G. ..... ☐ ☐ ☐ H. ..... ☐ ☐ ☐	☐ ☐ ☐ ☐ ☐ ☐
20	What is your present status & level of responsibility ----------	☐☐
21	How did you find your first job after graduation? Through Ministry of Planning ☐ The Institution where you studied ☐ Personal Contact ☐ Advertisement ☐ Other (please specify)	☐
22	A. Have you changed your first job since your graduation Yes ☐ No ☐ B. If so when? After 1st year ☐ 2nd year ☐ 3rd year ☐ 4th year ☐	☐ ☐
3	If the answer is Yes in question 22A, please indicate the reason(s) for changing your first job, according to their importance to you. A. ..... B. ..... C. ..... D.	☐ ☐ ☐ ☐

7		Research Use only
23	What was your annual income in first job after your graduation? 1200-1300 ☐ 1301-1400 ☐ 1401-1500 ☐ 1501-1600 ☐ 1601-1700 ☐ 1701-1800 ☐ 1801-1900 ☐ 1901-2000 ☐ 2001-2100 ☐ more than 2100 ☐	☐☐
24	A. Have you been promoted? Yes ☐ No ☐	☐
	B. If so, which kind of promotion did you receive?	☐
25	What is your present annual income? 1200-1300 ☐ 1300-1400 ☐ 1401-1500 ☐ 1501-1600 ☐ 1601-1700 ☐ 1701-1800 ☐ 1801-1900 ☐ 1901-2000 ☐ 2001-2000 ☐ More than 2100 ☐	☐
26	Do you work overtime? Yes ☐ No ☐	☐
27	On the average how many hours per week do you work at the present job in each of the following activities?	
	a. Applied engineering work ( ) hours	☐
	b. Engineering research ( )	☐
	c. Consultancy ( )	☐
	d. Administration ( )	☐
	e. Private studies conneced with job ( )	☐
	f. Social activities ( )	☐
	Others (please specify)	
	g. ..... ( )	☐
	h. ..... ( )	☐
	i. ..... ( )	☐
	Total ( )	☐

Appendix Two: The Questionnaire - Arabic Version

لاستخدام البحث		بحث عن خريجي الجامعة التكنولوجية / بغداد ـ العراق
1-3		رقم الاستمارة
4		رقم الكارت

ملاحظة :ـ يرجى وضع اشارة (x) في المربع المناسب .

	١	مكان العمل :
5		أ ـ اسم المنشأة : _____
6		ب ـ نوع المنشأة : عامة ☐ خاصة ☐ شبه رسمية ☐ اخرى ☐
7-8		جـ ـ المحافظة : _____
9	٢	القسم الذى تخرجت منه : _____
10	٣	أ ـ الجنس ذكر ☐ انثى ☐
11		ب ـ الحالة الزوجية : اعزب ☐ متزوج ☐ ارمل ☐ مطلق ☐
12-13	٤	سنة الولادة : _____
14	٥	محل الولادة : أ ـ القرية _____ ب ـ المدينة _____
15-16		جـ ـ المحافظة _____
17-18	٦	في أية محافظة حصلت على شهادة الدراسة الثانوية ؟ _____
	٧	ما هو اعلى تحصيل علمي لكل من والديك :

	أمي	يقرأ ويكتب	ابتدائية	متوسطة	ثانوية	دبلوم	بكلوريوس	دراسات عليا
19 أ ـ الأب	☐	☐	☐	☐	☐	☐	☐	☐
20 ب ـ الأم	☐	☐	☐	☐	☐	☐	☐	☐

21-22	٨	أ ـ مهنة الاب : _____
23-24		ب ـ الحقل الذى يعمل فيه : _____
25-26		جـ ـ مهنة الام : _____
27-28		د ـ الحقل الذى تعمل فيه : _____
29-30	٩	معدل الدرجات التي حصلت عليها في نهاية دراستك الثانوية ؟ ( )
31-32	١٠	ما هو اختيارك الاول للدراسة الجامعية ؟ _____

لاستخدام البحث		
	١١	لأى من الاسباب التالية كنت ترغب بالدراسة في الاختصاص المذكور اعلاه ؟ يرجى تحديد درجة الاهمية لكل من الاسباب التالية بالاشارة في المربع المناسب :

		مهم جدا	مهم	غير مهم
33	أ ـ كنت ترغب بتعقب صديق سبق وان اختار نفس الاختصاص .	☐	☐	☐
34	ب ـ نصيحة الوالدين بأختيار هذا الحقل من الدراسة .	☐	☐	☐
35	ج ـ هذا الحقل من الدراسة يعطي فرصة عمل جيدة .	☐	☐	☐
36	د ـ هذا الحقل من الدراسة يعطي مكانة اجتماعية .	☐	☐	☐
37	هـ ـ هذا الحقل من الدراسة يوفر راتب أعلى .	☐	☐	☐
38	و ـ كنت تحب هذا الحقل من الدراسة	☐	☐	☐
	أية اسباب اخرى يرجى تحديدها :			
☐	_____	☐	☐	☐
☐	_____	☐	☐	☐
☐	_____	☐	☐	☐
☐	_____	☐	☐	☐

	١٢	ما هي درجة النجاح التي حصلت عليها في نهاية دراستك الجامعية :
43		مقبول ☐ جيد ☐ جيد جدا ☐ ممتاز ☐
	١٣	أ ـ هل تطلب منك ان تقضي اكثر من ثمانية فصول دراسية للحصول على الشهادة الجامعية ؟
44		نعم ☐ لا ☐
45		ب ـ اذا كانت الاجابة بالنفي . هل تعتقد انه كان بامكانك ان تنهي دراستك بأقل من ثمانية فصول ؟ نعم ☐ لا ☐

لاستخدام البحث		
46 ☐		جـ ـ اذا كانت الاجابة بنعم في ب أعلاه ، ما هي الفترة التي تعتقد انك كنت تحتاجها لانهاء دراستك ، (يرجى تأشير واحد منها فقط) : سبعة فصول ☐ ستة فصول ☐ خمسة فصول ☐
47-48 ☐☐	١٤	اذا كانت الاجابة بنعم في سؤال ١٣ ب ، ما هي أهم الاشياء التي تحتاجها لانهاء دراستك في اقل من ثمانية فصول دراسية . يرجى شرحها او تعدادها حسب درجة اهميتها :
		١ ـ _____
49-50 ☐☐		٢ ـ _____
51-52 ☐☐		٣ ـ _____
	١٥	كيف تقيم درجة اهمية الجوانب التالية من دراستك الجامعية من خلال فائدتها لعملك الحالي :

	مهم جدا	مهم	غير مهم
53 ☐	☐	☐	☐
أ ـ المناهج الهندسية			
54 ☐	☐	☐	☐
ب ـ المناهج العامة			
55 ☐	☐	☐	☐
جـ ـ المناهج المختبرية			
56 ☐	☐	☐	☐
هـ ـ التدريب الصيفي			
57 ☐	☐	☐	☐
و ـ المناهج الاجتماعية			

يرجى اضافة اية ملاحظات عامة ترغب بها

58 ☐	☐	☐	☐
	☐	☐	☐
	☐	☐	☐

لاستخدام البحث		
	١٦	يرجى تحديد درجة كفاية اعدادك الجامعيّ لعملك الحالي في كل من الجوانب التالية :

	كافية جدا	كافية	غير كافية
66 أ ـ مدى شمولية المواضيع الدراسية	☐	☐	☐
67 ب ـ محتوى المحاضرات	☐	☐	☐
68 جـ ـ طريقة التدريس	☐	☐	☐
69 د ـ التسهيلات المكتبية	☐	☐	☐
70 هـ ـ التسهيلات المختبرية	☐	☐	☐
71 و ـ المساعدة في حل المشاكل الشخصية	☐	☐	☐
يرجى اضافة اية جوانب اخرى ترغب بهـا :			
☐ _____	☐	☐	☐
☐ _____	☐	☐	☐
☐ _____	☐	☐	☐

End of Card One

	١٧	ما معدل عدد الساعات الاسبوعية التي كنت تعمل بها خلال وجودك في الجامعة التكنولوجية في كل من النشاطات التالية : ـ
5 ☐	(١) المحاضرات (الدروس النظرية)	( ) ساعة
6 ☐	(٢) المناقشات و حل التمارين	( )
7 ☐	(٣) النشاطات المكتبية	( )
8 ☐	(٤) النشاطات المختبرية	( )
☐	النشاطات الاخرى يرجى تحديدها •	
☐	(٥) _____	( )
☐	(٦) _____	( )
☐	(٧) _____	( )
☐	(٨) _____	( )
15-16	المجموع	( )

لاستخدام البحث		
☐☐ 17-18	١٨	في اى اختصاص تعمل حاليا :
		هندسة ميكانيكية ☐ هندسة كهربائية ☐ هندسة بناء انشاءات ☐ هندسة السيطرة والنظيم ☐
		هندسة كيمياوية ☐ هندسة معمارية ☐ اية اختصاصات اخرى يرجى توضيحها بكلمتين على الاقل .
		_____
	١٩	اذا كنت تعمل الان في غير اختصاصك الجامعي ، يرجى تحديد اسباب التغيير و درجة اهمية كل منها بالنسبة لك .

		مهم جدا	مهم	غير مهم
☐ 19	أ ـ لم تتمكن من الحصول على عمل في مجال اختصاصك .	☐	☐	☐
☐ 20	ب ـ عملك الحالي يوفر راتب اعلى	☐	☐	☐
☐ 21	ج ـ عملك الحالي يوفر فرصة افضل للنجاح	☐	☐	☐
☐ 22	د ـ عملك الحالي هو في المدينة التي نشأت فيها	☐	☐	☐
	اسباب اخرى يرجى تحديدها .			
☐	هـ ـ _____	☐	☐	☐
☐	و ـ _____	☐	☐	☐
☐	ز ـ _____	☐	☐	☐

	٢٠	ما هو مركزك الوظيفي الحالي ؟ يرجى توضيحه بكلمتين على الاقل .
		_____
☐☐ 28-29	٢١	ما هي طريقة حصولك على عملك الاول بعد التخرج ؟ تم ذلك عن طريق :ـ
☐ 30		وزارة التخطيط ☐ الجامعة التي تخرجت منها . ☐ اتصالات شخصية ☐ اعلانات ☐
		من خلال وسيلة اخرى يرجى تحديدها : ـ
		_____

لاستخدام البحث		
31 ☐	٢٢	أ ـ هل غيرت عملك الاول الذى عينت فيه عند تخرجك ؟ نعم ☐ لا ☐
		ب ـ اذا كانت الاجابة بنعم في (أ) اعلاه متى حدث ذلك ؟
32 ☐		خلال السنة الاولى بعد التخرج ☐ السنة الثانية ☐ السنة الثالثة ☐ السنة الرابعة ☐
☐		جـ ـ اذا كانت الاجابة بنعم في (أ) اعلاه يرجى تحديد الاسباب التي دفعتك الى تغير عملك الاول حسب درجة اهميتها لك :
☐		(١) _____
☐		(٢) _____
☐		(٣) _____
☐		(٤) _____
	٢٣	ما مقدار دخلك السنوى عند تخرجك بالدينار العراقي ؟
		من ١٢٠٠ ـ ١٣٠٠ ☐ ١٣٠١ ـ ١٤٠٠ ☐ ١٤٠١ ـ ١٥٠٠ ☐ ١٥٠١ ـ ١٦٠٠ ☐
41 ☐		١٦٠١ ـ ١٧٠٠ ☐ ١٧٠١ ـ ١٨٠٠ ☐ ١٨٠١ ـ ١٩٠٠ ☐ ١٩٠١ ـ ٢٠٠٠ ☐
		٢٠٠١ ـ ٢١٠٠ ☐ اكثر من ٢١٠٠ ☐
43 ☐	٢٤	أ ـ هل حصلت على ترقية في العمل ؟ نعم ☐ لا ☐
		ب ـ اذا كانت الاجابة بنعم ما هو نوع الترقية التي حصلت عليها ؟
44 ☐		ترقية في السلم الوظيفي ☐ ترقية مادية ☐ ترقية في المسؤوليات والواجبات ☐
		اخرى يرجى تحديدها : _____
	٢٥	ما مقدار دخلك السنوى الحالي بالدينار العراقي ؟
		من ١٢٠٠ ـ ١٣٠٠ ☐ ١٣٠١ ـ ١٤٠٠ ☐ ١٤٠١ ـ ١٥٠٠ ☐ ١٥٠١ ـ ١٦٠٠ ☐ ١٦٠١ ـ ١٧٠٠ ☐
45 ☐		١٧٠١ ـ ١٨٠٠ ☐ ١٨٠١ ـ ١٩٠٠ ☐ ١٩٠١ ـ ٢٠٠٠ ☐ ٢٠٠١ ـ ٢١٠٠ ☐ اكثر من ٢١٠٠ ☐
46 ☐	٢٦	هل تعمل وقت اضافي : نعم ☐ لا ☐

لاستخدام البحث		
	٢٧	ما معدل عدد الساعات الاسبوعية التي تقضيها في عملك الحالي في كل من النشاطات التالية :
47 ☐		(١) عمل هندسي تطبيقي ( ) ساعة
48 ☐		(٢) بحث هندسي ( )
49 ☐		(٣) استشارات هندسية ( )
50 ☐		(٤) عمل اداري ( )
☐		نشاطات اخرى يرجى تحديدها
☐		(٥) _____ ( )
☐		(٦) _____ ( )
☐		(٧) _____ ( )
☐		(٨) _____ ( )
☐		(٩) _____ ( )
☐		المجموع _____ ( )